

DOCTORAL THESIS

Techniques of Training Pain in Performance Somatic Practices and Altered States of Consciousness

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**Techniques of Training Pain in Performance:
Somatic Practices and Altered States of
Consciousness**

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A thesis submitted in partial fulfilment of the requirements
for the degree of PhD

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Abstract

This practice-as-research project (a) invents, examines and self-reflects upon two techniques—*Whirling in Pain* and *Neurobreathing*—that the author has developed for dealing with pain in performance, (b) creates a framework for the qualitative analysis of pain retraining techniques by conducting an interdisciplinary study of the parameters that describe Somatic Practices and the psychology of Altered States of Consciousness, (c) establishes a taxonomy and classifications for describing and assessing techniques of pain management in the performing arts, (d) qualitatively assesses the training techniques of three practitioners —Antonin Artaud, Jerzy Grotowski and Marina Abramović—who have used Somatic Practices and Altered States of Consciousness in their techniques, and draws out patterns and themes in their practice, (e) distils generic principles of practice that are essential for training pain perception and could be used by other practitioners for developing their own techniques, or to better embody the techniques that the author has developed. These transferable principles are: reinforcement, exhaustion of pain-processing resources, inquisitive modes towards otherness, embodied knowledge, surrendering, Sisyphean reiteration, and music's capacity for fascination.

This dissertation considers the issue of dealing with pain in performance beyond the limited area of theatre pedagogy, suggesting an interdisciplinary approach and expanding its scope into the wider realms of theoretical discourse around culture and pain. This dissertation argues that since pain is not only a biochemical process but one that is culturally constructed, it is therefore possible to retrain or un-train the perception of pain through the facility of Somatic Practices that induce Altered States of Consciousness. Such retraining of pain perception has wider socio-political ramifications that challenge the pervading modern and neoliberal culture around pain,

which understands it only through a reductively biological model and relies heavily on the use of exogenous analgesics to alleviate pain. Finally, this dissertation proposes that dealing with pain is possible not only by transcending and moving attentional focus away from pain, but also by entering a plane of immanence, achieved through working synergistically with pain in order to find the coping mechanisms and hidden reserves that lie dormant within the individual.

The practical element of this submission consists of (a) a Manual for Practitioners that describes the techniques step-by-step, and explains the principles behind them and, (b) two performance videos that exhibit how the author has used the two techniques to create and manage pain within performances.

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I. Introduction

Origin and purpose

I was singing a wannabe-rock song during one of my performances at the Greenroom theatre in Manchester, when all of a sudden I got excited and hit the floor with my fist in an ecstatic frenzy. I didn't realise anything in that moment, or even after the performance when people came to congratulate me, although I did notice a swelling and bruising of my lower arm when I tried clenching my fist to pick up a gift. I thought that this irregular swelling of my arm would soon be gone. But the euphoria of the performance soon faded away, replaced by a massive drop of endorphins that made me feel emotionally vulnerable. Then I felt a thick, unambiguous lance of totalising pain, like a bulldozer running over my arm and chest. Physically and mentally it was impossible for me to sleep. I had an alien swollen arm attached to my body that was occupying my thoughts. In order to get rid of that thought, I started thinking about the performance again, remembering my mistakes, blaming myself and torturing myself mentally by feeling guilty. The physical pain could only be substituted by mental pain and I was caught up in this limbo of negative emotions and feelings.

Since I couldn't fall asleep, I decided to make myself some tea. Semi-awake and carried away by my guilty thoughts and physical pain, I turned on the hob and put the kettle on. What I hadn't noticed was that I had accidentally turned on the wrong hob, and on it was a roll of cling-film. After a while, the smell of the burning plastic jerked me out of my bubble and I removed the cling-film from the hob immediately with my hands. It took me two or three seconds to realise that the cling film was now

melting on my palm, and that the burning plastic was attaching itself to my skin and giving me a second-to-third degree burn.

I woke up my partner at the time, and asked him to accompany me to A&E. We had to wait there for almost three and a half hours. On one hand, I had a burnt palm, and in that same hand I had a broken scaphoid. The doctors gave me a cast and applied an ointment onto my burnt skin. My experience was oscillating between the accumulating forces of two pain sources, and two pains annihilating each other. Whenever the physical pain was excruciating, I had to think about the performance; whenever the pain in my arm faded away, I rushed to think about it again so as to avoid thinking about the performance and suffering from further guilt. My brain was working overtime, but it was my coping mechanism.

The first thing I noticed was that my experience of pain was in some ways easily malleable as a direct consequence of my thoughts, as if I had a knob that I could turn up or down in intensity according to my mental activity. Pain brings about a dialogue between body and mind. Consciousness of my own pain turned me into both a subject and object of study: I was the scientist who observes and the patient who feels at the same time. I also observed my desire to continue feeling the bodily pain in order to avoid the mental entanglements and guilty thoughts after the performance. The sensation of physical pain was a way of escaping from the psychological traps and traumas of post-performance blues.

For the next few days, I joined the ranks of one of the world's biggest invisible subcultures - those who live with some form of daily pain. Pain affects almost 10 million people in the UK according to the British Society of Pain, resulting in a major impact on their quality of life (British Society of Pain, 2014). I noticed how my

awareness immediately narrowed down to my physical pain and became my new preoccupation.

There was no confusion whatsoever that my experience of pain was of a dualistic nature; that the mind could influence the power the physical pain held over my thoughts, and that the physical pain influenced the power my thoughts had over my experience. This power of body over mind, and mind over body was of significant interest to me for the next few days until I had my cast removed.

At the same period, I was invited to watch Ron Athey's *Self Obliteration* (2009) at 'Visions of Excess' held at Shunt, London. During this performance, Ron Athey vehemently brushes a long blond wig attached to his scalp with long surgical needles. With each brush, the wig, needles and scalp get pulled; the piercings on the skin become bigger and the wig redder with blood. After a while, Ron Athey removes the needles and the wig; free-flowing streams of blood take its place. When I saw the performance again in Glasgow at the National Review of Live Art, the piercing was so extensive that one of the arteries projected blood some meters away from the performing body. Athey then used his own blood mixed with lubricant to fist himself. Over time, it became clear through Athey's facial expressions (his eyes rolling upwards into the back of his skull, his slowing movement, his faltering balance etc.) that he had 'tripped' mentally to another state of consciousness. In that moment, I was left wondering about the methods Athey had employed in order to arrive at such acts of 'self-obliteration', and what kind of training one needs to undertake in order to transform pain into a transcendental experience. It was obvious from my own experiences with a broken arm and burnt hand that I was able to use my thinking to alter my pain perception, but I was not in full command of this ability. Athey on the other hand had mastered to conquer his pain, not only to make this experience

meaningful, but to use it as a tool and weapon to convey his complex ideas on HIV stigma, the sanctity of the body and religion.

I was intrigued, and wanted to understand and master this power to transform one's painful experience into a useful tool. I started researching theoretically and practically on self-inflicted pain in performance art. Literature on the matter of pain in performance art aims to illuminate the artistic, cultural and political significance of self-inflicted pain performances, and aims to establish self-inflicted pain performances as a field for academic and artistic consideration in their own right.

From establishing hermeneutics to developing technologies

There is an abundance of books and articles on Performance and Live Art that have included, described and analysed performances of self-inflicted pain. In her book *Performance: Live Art since the 60s* (2004), RoseLee Goldberg describes performances of self-inflicted pain such as Chris Burden's *Shot* (1971), Gina Pane's *Escalade* (1971), Vito Acconci's *Seedbed* (1972), Ron Athey's *Martyrs and Saints* (1993) and Bob Flanagan's *Visiting Hours* (1993). She explains how this this body of work manages to problematize the relationship between the performer and the audience, and to 'open a disquieting discourse of contemporary politics and daily life' (99). In their book *The Artist's Body* (2012), Tracey Warr and Amelia Jones included their own descriptive accounts of other performances of self-inflicted pain such as Chris Burden's *Trans-Fixed* (1974), Bob Flanagan's *Autoerotic* (1989), Marina Abramović's *Rhythm 2* (1974), Stelarc's *Event for Stretched Skin* (1976) and ORLAN's *Omnipresence* (1993), where they stress how these works challenge 'the very boundary between art and its audience' (114). Similarly, in his book *Live* (2012), Adrian Heathfield refers to performances of endurance or pain as works whose 'live

force is excessive'. For Heathfield, pain performances should not be reduced 'by their popular miscomprehension within a generic notion of "shock tactics"' but should rather be understood as a means to critique cultural norms and fixed perceptions.

In her book, *Contract with the Skin: Masochism, Performance Art and the 1970's* Kathy O'Dell (1998) explains how the masochistic acts of performance artists such as Vitto Acconci, Marina Abramović, Ulay, Gina Pane and Chris Burden were a response to the political situation in the US, especially with regards to the Vietnam war. O'Dell aims to establish the 'social relevance of masochism' (4) and to reveal the political importance of such acts. In so doing, O'Dell argued for the redemption of masochistic art practice, and her efforts opened the path for the subsequent de-pathologisation of such practices, finding artistic value in their political engagements.

Patrick Campbell and Helen Spackman analyse the artist Franko B's work by first of all trying to identify a wider wave of artists who use their own blood as a tool *for* and material *of* their performance. This is to ensure that Franko B's work is not seen as a stand-alone example but exists within a community of performance artists dealing with similar practices. Later, they go on to explain the significance of Franko B's work as a practical exploration of Kristeva's theory on abjection, and more specifically, of relationships between the internal and the external, the private and the public, since his work problematizes the relationship between the audience and the performer. For Campbell and Spackman 'the pain in performance reflects the pain in human relationships, but by experiencing rather than repressing the pain, Franko B transcends it' (Campbell and Spackman, 1998: 64). The concept of pain-transcendence appears in this article, but the authors focus more on contextualising the work of Franko B and so unfortunately do not explain how 'experiencing rather than repressing' (idem) can transcend pain.

Similarly, in her article *Empfindnis and Self-Inflicted Pain in Performance Art* (2013), Helga Meyer uses the work of Üdi Da to explain how pain on stage can create a special exchange with the audience that is not obtained in other kinds of performance. This special character of the spectatorship of pain is also found in Gianna Bouchard's *Be not faithless but believing* (2008) where she problematizes the staging of the anatomized body and the ethics of the body in display. Bouchard explains that the wounded body serves as a prop for persuasion and questions whether it has the capacity to deliver specific truths. In her *Performing Bodies in Pain: Medieval and Post-Modern Martyrs, Mystics, and Artists*, Marla Carlson (2010) examines the effect upon those who witness pain and argues that the spectacle of pain serves as 'a call to action for the spectator' (6). For Carlson, the power of the spectacle of pain relies not on the individual who suffers but on the group that have become spectators of pain. The analysis here focuses on the politics of empathy, and on claiming that the use of pain and suffering in the works of artists such as Ron Athey, Sarah Kane, Marina Abramović and others is not a contemporary invention but bears strong resemblances with many descriptions of late medieval life. Through drawing these connections, Carlson attempts to express the universality and centrality that the spectacle of pain can have, and which transcends both the medieval and the post-modern world.

Live Art literature has so far predominantly focused on the special character of pain on stage, the problematics of staging pain, the difficulty of the spectatorship of pain, and the relation between the audience and the performer. It identifies the socio-political values of performances of self-inflicted pain as a way of bringing serious discourse and attention to the field. This literature has helped to inform the Live Art scene, and supported the establishment of a community of artists whose work carries

strong academic, philosophical and theoretical arguments. But despite the hermeneutic support of academia, there is still a gap in identifying technologies that can enable new initiates to enter this field safely and efficiently. There is no book or article written on how artists have practically managed to utilise self-inflicted pain, nor a literature that can prepare artists to become part of this intellectual or artistic community. This research serves to fill this lacuna by inventing and analysing techniques for pain management in the performing arts. The research in this PhD pursues this line of inquiry, where self-inflicted pain in performance demonstrates strong socio-political, artistic and cultural values. Rather than trying to prove these values, my interest lies in what comes after we have established the role of self-inflicted pain in performance, looking more deeply into the way our culture perceives pain, the reasons behind those perceptions, and then finding ways in which myself and other practitioners can go about putting this knowledge into practice, in order to deal with pain in performance.

By looking at the problematics and politics of the Modern, Western, neoliberal culture's perception of pain¹, this research (a) invents, examines and self-reflects on techniques for dealing with pain in performance, and (b) creates a framework for the qualitative analysis of such techniques. The goal is not to merely describe specific body exercises that operate within the field of performance, but to extract generic principles of how we as practitioners may need to deal with pain, how we respond to the problematic aspects of the pervading attitudes towards pain, and to establish a vocabulary for describing and assessing these techniques at the same time.

¹ Throughout this research, I use the pronouns 'we' and 'our' predominantly to identify what David Morris refers to in his book, *Culture of Pain* (1993), and is mostly concerned with the Western, neoliberal culture, society and their understanding of pain.

Of course, within the above argument lies an axiom: that pain-perception is not only a biological product but also a cultural one; one that we can train and manipulate. A large and growing body of literature has questioned the purely biological model for understanding pain, and has explained that the way we express and experience pain varies not only according to genetics and physiology, but most importantly as a result of ‘learned “hermeneutics”’: the way we *interpret* our pain’, which is influenced by our culture² (Coakley and Shelemay, 2008: 1). In 2007, the Mind Brain Behaviour Interfaculty Initiative of the University of Harvard organised a conference on interdisciplinary research on pain, and published an edited volume of the conference papers called *Pain and Its Transformations: The Interface of Biology and Culture* (Coakley and Shelemay, 2008). The conference and the book have been landmarks in the study of pain, in that they made the fundamental claim that ‘because the mystery of pain cannot be effectively probed merely reductively, it demands a wider interdisciplinary investigation. Ultimately, the solution to the problem requires creative forays into the arenas of philosophy, psychiatry, theological and religious studies, anthropology, literature, musicology, art, and ritual theory if all the dimensions of pain are to be tested and understood’ (Coakley and Shelemay, 2008: 3). My research builds upon this claim and aims to take it further by providing an analysis of the methods and technologies Live Artists might follow in order to prepare themselves to deal with pain in performance. At the same time, for this analysis, I will also use the suggested methodological tool of an interdisciplinary research practice in order to ground myself in current research, and to allow myself to talk about the meaning of pain and the capacity of the Live Artist to transform it. In that sense, the technologies required for the transformation of the perception of self-inflicted pain

² For more information on the matter Kleinman (1988), Kleinman, Das and Lock (1997), Morris (1991), DelVecchio (1992).

need to include philosophical, neuroscientific, historical and performance studies as a means of preparation.

My methodology is fivefold: (1) a literature review gesture where I try to identify the current perception of pain in the Western, modern, neoliberal culture based on philosophy, politics and cultural theory, as a means of suggesting areas for the new techniques to focus upon; (2) the creation of an interdisciplinary framework of analysis that can qualitatively and methodically examine the hybrid techniques that fuse Somatic Practices and Altered States of Consciousness; (3) a historical analysis of previous techniques that fuse Somatic Practices and Altered States of Consciousness, as a way of discovering possibilities for moving forward; (4) a rigorous studio-based practice-as-research interrogation of various methods and exercises that deal with pain in performance; (5) qualitative research by means of observation, self-reflection, and theoretical, neuroscientific and cultural theory, underpinning my own practical explorations and endeavours in the field of self-inflicted pain in performance art. These five different methods have not been in isolation of each other, nor have they happened on different occasions; they have coexisted and operated at the same time, influencing one another and supporting the rigorous cohesion of my outcomes.

The overall structure of this dissertation takes the form of six chapters, including this general introduction and the manual for practitioners. Following the introductory chapter where I present the motivations, research questions, methodologies and limitations of the work, the second chapter focuses on explaining briefly how the two conventional models (psychiatric and purely biological) for explaining pain have failed to help in dealing with pain: the first one has rendered pain a taboo while the second one has made us reliant on drugs. The chapter then

moves on to provide a third model that is currently being developed within the scientific and cultural studies communities, one that considers the role of culture, and moves away from sensation to the perception of pain. It is within this third context of understanding pain that I find directions for progressing my own research: developing a technique that can deal with the problematic aspects of popular perceptions of pain currently needs to engage with Somatic Practices that induce Altered States of Consciousness.

In the third chapter, I am looking at the intersections between Somatic Practices and Altered States of Consciousness, and how other artists have used this intersection to create their own pain-management techniques. I explain each field separately, including its origins and, most importantly, how each field operates, in order to understand how they can be combined. Next, I examine how other artists have already amalgamated Somatic Practices and Altered States of Consciousness. The goal is not to collect descriptive reports of techniques of training pain perception, but rather to analyse and elucidate how these techniques fuse Altered States of Consciousness with Somatic Practices, in order to identify and extract specific themes or patterns that are essential for dealing with pain in performance. The three artists I am looking at are Artaud, Grotowski and Abramović. There are two reasons for choosing these three artists. Firstly, there is an abundance of information on and descriptions of their techniques existing already within the literature of physical theatre, which allows me to proceed swiftly to qualitative analysis and so extract patterns and themes for developing my own practice. By looking closely at their work, it's apparent that their techniques belong not only to physical theatre practices but have specific and unique connections with pain. As a result, all three artists' practices offer a different understanding of how to deal with pain to my own practice.

More specifically, Artaud (who suffered personally from severe neuralgia) saw pain and suffering as essential passageways to wisdom and embodied knowledge.

Grotowski saw pain as a form of salvation from the existential anxieties of human nature and believed that meticulous articulation of an exercise can produce Altered States of Consciousness. Abramović considers pain as a way of regaining control of her own body and her practice employs hyperalertness to deal with endurance.

Although all three artists have methods for dealing with pain in performance, they don't all speak of the same type of pain. Grotowski mostly deals with the pain of emotional suffering (which is not the focus of this dissertation); even when he is dealing with physical pain, it is often more as an illusion or representation of pain rather than actual pain. Conversely, the pain Abramović experiences in *Rhythm 2* (1974) where she is wounding her fingers with a knife is undoubtedly real.

Consequently, the second reason for choosing these well-documented artists is not because of their affinity with or understanding of pain, but rather because all three envisioned a synthesis of Somatic Practices and Altered States of Consciousness to deal with pain. It is this synthesis in practice and the ways it can be made efficient that is the focus of this chapter. And although there have been many things written about these three artists and their techniques, there is no paper that specifically analyses their work specifically through the lens of hybrid techniques of Altered States of Consciousness and Somatic Practices, and how these techniques can serve as models of preparation for other artists dealing with pain. For this reason, I have had to construct my own framework of analysis. I suggest looking more closely at the characteristics, elements and dimensions of Altered States of Consciousness and Somatic Practices, and the ways they can bring about a transformation in the individual's perception of self-inflicted pain in performance. By combining these

characteristics and dimensions into a single formula, and adjusting and gearing that formula towards transformations of pain-perception, I am attempting to create a framework for analysing hybrid techniques that fuse Somatic Practices and Altered States of Consciousness. I then use this framework to unpack and gain further insight into the works of Artaud, Grotowski and Abramović, so that I may identify, extract and critically assess specific themes of their practice, which may be pertinent for training a performer to deal with self-inflicted pain.

In the fourth and fifth chapters, I describe, examine and critically self-reflect upon the techniques that I have developed in the studio as part of my practice-as-research. These techniques are built upon the foundations of the principles of practice identified in the previous chapter, upon which I elaborate and expand. The first technique is *Whirling in Pain*, which I have developed based on my previous training as a Mewlewi Sufi Whirling Dervish. The second technique is *Neurobreathing*, a fusion of *pranayama* breathing exercises and neurofeedback technologies. I have created these two techniques as diametric opposites of each other, based on the way they approach pain-management. The former puts the performer's focus of attention onto the actual sensation of pain, whereas the latter diverts attention away. By unpacking my practice and analysing it rigorously, the goal is not to prescribe specific exercises; rather, it is to offer some principles of practice that can be shared and transferred to others easily, so that they may create new techniques for dealing with pain in performance in a safe and effective way.

Finally, instead of a conclusion, the last chapter offers a manual for practitioners, explaining how to practice the two techniques and embody their principles step-by-step. This chapter draws upon my knowledge from my practice-

based research on how to train to deal with pain, and codifies the work in a way that is easy to digest.

The self-infliction of pain during Live Art events has certainly acquired its own momentum and more artists are now willing to experiment with the boundaries of their own bodies. Research on such practices has so far focused upon demonstrating their artistic value and significance (especially as a means of revolting and transgressing) but the ways that these artists are able to manage such levels of pain, and the possible repercussions of such actions, have been completely ignored. The research aims to alert both Live Art practitioners and academics to the need for further examination into technologies of pain-perception transformation; to distil some principles around dealing with pain; and to provide practical techniques for Live Art practitioners to use, engendering further creative research on pain and transformations of pain-perception.

Definitions and limitations of research

I want to clarify that this dissertation only focuses on developing techniques for preparing the performer to deal with pain in performance, and critically analysing their qualities and political implications. This research does not examine the politics of empathy and the exchange of pain between performer and audience. Previous literature has established that performances that attend to pain are political, and that the political power of the performance lies in the relational exchange with the audience (Blocker, 2004) (Schneider, 2011) (Campbell and Spackman, 1998). Rather than focusing the discourse on how politically-engaged performances of pain are based on the difficulty of spectatorship, the focus of this research is in situating the discourse solely on the creation of techniques to deal with pain in performance, and

how their creation is of a political nature since they respond creatively to the maladies of our current culture of pain perception.

This research is also looking at those practices where self-inflicted pain is used in the context of performance and Live Art. Cases where self-inflicted pain happens in private and without any artistic intention is outside the reach of this project. The dissertation does not focus on psychoanalysing the desires and drives of each artist, but on discussions around the artistic merit of challenging perceptions of the body in the somatic, technical, socio-cultural and political sense. While I may occasionally share and disclose personal facts that have influenced my own or a particular artist's body, I do so only in order to contextualise the artistic practice; in no way is my intention to shift the focus from reflection upon artistic merits to psychopathological valuations.

In the context of this project, the experience of pain begins, at a reductive level, as 'a neurobiological sensory function of the brain and the spinal cord' (Wolf, 2007: 27). Yet this definition fails to take into consideration the subjective sensation and already commits, as Coakley and Shelemay have stated, 'an implicit philosophical error - that of dualism' (2008: 3). As these authors have shown, there 'is no (conscious) physical pain that is not also neutrally "interpreted"' (6). This means that pain is not only a biophysical field of study, but other disciplines such as philosophy, religion, psychology, sociology and performance studies have much to contribute when it comes to how the subject interprets the noxious neurophysiological signal in their brain. However, this does not mean that my interest in pain is purely a mental/psychological one. According to the International Association for the Study of Pain, 'pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage' (IASP, n.d.). In that

sense, pain needs to be distinguished from the word ‘suffering’, which I take to mean an emotional reaction to a number of causes but not necessarily related to tissue damage. For example, the loss of a loved one or bipolar depression are reasons for deep suffering but not necessarily pain. We might use the word ‘painful’ but only in a metaphorical sense. This distinction is fundamental because it helps me to point towards the ways in which pain can be treated as a useful and important sensation worthy of understanding and cultivating. In fact, one might go so far as to say that ‘pain can be the solution to suffering, a psychological analgesic that removes anxiety, guilt, and even depression’ (Glucklich, 2001: 11). However, at the centre of this distinction between emotional suffering and physical pain, is what makes an experience painful or not. Emotions surrounding an event may alter the perception of the experience altogether. *The Pain in Men Wounded in Battle* by Lieutenant Colonel Henry K. Beecher in 1946, for example, shows that 57 per cent of soldiers who were wounded in battle experienced little or no pain, and that more than 75 per cent asked for no medication in the hours immediately after becoming wounded. These results, when placed in a comparison with a civilian who is injured in an accident while going about their daily business show that:

Strong emotion can block pain. That is common experience. In this connection, it is important to consider the position of the soldier: his wound suddenly releases him from an exceedingly dangerous environment, one filled with fatigue, discomfort, anxiety, fear and real danger of death, and gives him a ticket to the safety of the hospital. His troubles are about over, or he thinks they are. He overcompensates and becomes euphoric [...] On the other hand, the civilian’s accident marks the beginning of disaster for him. (Beecher, 1946: 448)

The main point here is that the emotions surrounding events can powerfully exacerbate or alleviate the perception of pain. Reports from experiments on stress

induced analgesia, such as Hagen and Green (1988), show that under stress and shock, the body produces opiate-like analgesic peptides that can result in an experience of painlessness i.e. an emotion, despite the fact that there is pain (as defined by the IASP) and that the nociceptive system, the sensory nervous system used to process and respond to noxious (meaning harmful or potentially harmful) stimuli, is in alert mode.

The above clarification is important, especially because this dissertation deals solely with cases of self-inflicted pain rather than pain that is stimulated externally. The person who inflicts pain on their own body is in full control of their emotions, and has a greater capacity to regulate their mind, constructing an environment that allows them to self-harm without any unexpected external stimuli. Control is a key theme here. Accordingly, this research only focuses on those cases where pain is self-inflicted and not on those where pain happens without the consent of the subject. This study might include cases where one person cuts the flesh of another but always and only after consensual agreement has been made prior to the act, for in that sense the subject is ready and fully-prepared for the exact ways such an act on their body may occur. Consensual agreement and exact knowledge of the ways in which pain will be inflicted are prerequisites for this study, meaning all other cases (for example, an artist filming a policeman throwing teargas at them, or an audience member being manipulated on the stage) are out of the scope of this research.

This research deals with identifying different techniques for dealing with pain. The most common expression for dealing with pain is ‘transcending pain’. Taking this expression further, for some scholars - and especially for many meditation practitioners – the term equates more specifically with directing awareness away from pain as a method of dealing with it (Turk, Wilson and Swanson, 2011: 32). For others,

especially those interested in theological discourses, ‘transcending pain’ occurs when the person in pain manages to find a meaning behind or beyond the pain. There are many examples in the history of religion about blood rituals and initiations where the believer ‘transcends pain’ as a way of approaching the divine truth (as described in the Book of Job); as a rite of passage (seen in the crocodile scarification rituals of Papua New Guinea); or as punishment for a sin, or simply being human (Glucklich, 2001). Viewed from this perspective, ‘pain-transcendence’ becomes a method of pain management where the person in pain shifts attentional focus away from the actual painful sensation and towards discovering meaning in pain *beyond* the sensation. Consciousness is focused not on the sensation of pain but rather on higher levels of cognition that manage to bypass the perception of pain, and aims to understand the reasons behind the pain, or what the pain stands for (Morris, 1991). This definition of pain management is equally important for what it excludes: the possibility of a technique that deals with pain by maintaining attentional focus *in* the actual sensation of pain. If transcending pain means coping with pain by moving *beyond* pain, then another term is necessary to explain instances of coping with pain by remaining *in* pain. In order to talk about practices of pain management that do not shift attention away from pain, but rather focus on the sensation of pain as a way of dealing with pain, I turn to the term of ‘immanence’ to find the internally-focused concept of oneness.

Traditionally, the terms immanence and transcendence have been used extensively in theology, usually as opposite terms and referring to the relation of God to the world. In the Aristotelian and most Abrahamic viewpoints, God is outside and beyond the world: he is the prime force who created the world out of nothingness. Therefore, trying to learn and understand the divine truth is a transcendental move

directed outside and beyond the immediate world. In contrast to transcendental movement towards an external truth, Stoics see God as part of this world, manifested in the world's entirety; therefore, God cannot be considered as existing outside. Any effort to understand the divine truth is not a move towards an outside entity but an attempt to understand the whole world from within. This is a case of immanence.

Following this, modern philosophers have tried to take these two terms and apply them to understandings of how knowledge is produced, doing so by stripping them of their theological connections to God. The first and most prominent figure in this move was Immanuel Kant, the early modern philosopher who explained in his *Critique of Pure Reason* that all knowledge is transcendental because in order for humans to understand the world they need to create and synthesise concepts. This creation of concepts to explain the actual world and its objects is a transcendental move *beyond* the actual objects. For Kant, knowledge and knowledge-acquisition is a conceptual construction beyond the material world. In that sense, knowledge is transcendental since it creates something that did not exist before. In contrast to that, Gilles Deleuze maintained that knowledge can only be part of the actual world; that humans can only perceive the world from within; they cannot stand as outside entities whose modes of experiencing and perceiving the world are not part of this actual world. For Deleuze, humans are immersed within the world, and the senses with which they perceive it are a part of the actual materiality of that same world. All perception and conception of the world is then on a plane of immanence since we are bound to the materiality of our bodies, and what they can and cannot perceive. Deleuze favours immanence and explains that transcendence is a fabricated concept, and in-fact comes from a place of immanence. 'Although it is always possible to invoke a transcendent that falls outside the plane of immanence, or that attributes

immanence to itself, all transcendence is constituted solely in the flow of immanent consciousness that belongs to this plane. Transcendence is always a product of immanence' (Deleuze, 2001: 31). The transcendent must be thought of as a derivation of what is immanent. In that sense, Deleuze is trying to move away from the body/mind dichotomy that dictates that thought is irrelevant to the body. By saying that 'the immanent event is actualized in a state of things and of the lived that make it happen' (Deleuze, 2001: 31) he aims to demonstrate how the body not only influences thinking but *is* thinking, and how thinking is intricately related to the materiality of the body.

In line with the development of these two terms, I propose using transcendence and immanence diametrically in order to explain how each technique of self-inflicted pain management relates to pain. By using the term transcendence in its Kantian sense, I refer to a move *away* from the actual sensation of pain towards the construction of conceptions and cognitions *beyond* the actual material world. By using the term immanence in its Deleuzian sense, I refer to the importance of understanding that one is intricately immersed in the actual material world; that all discourse around cognition and perception needs to start from recognising that one is *inside, made of and part of* the actual material world; and therefore, any discourse needs to focus on the lived experience. The criterion that I use for this dichotomy is the relation of pain-management technique *to* the pain or *within* the pain itself. If the preposition used when referring to the relationship between the pain management technique and pain is 'to' then it is a technique of transcendence; if it is 'in' pain, then it is immanence. A technique of pain-transcendence means that the focus of the technique is standing outside of pain, or avoiding pain as a way to deal with it. Conversely, adopting a technique of pain-immanence means that there is a sense of

‘oneness’: being in pain and dealing with pain as being exactly the same process. In pure immanence there is absolute fusion, or to use theological jargon, there is univocity between pain and dealing with pain: being in pain teaches one how to deal with pain.

An extreme transcendental perspective would impose a binary: on the one hand being in pain and, on the other, avoiding pain or a complete lack of painful stimuli. Following this binary, it is impossible to be in both worlds at the same time, since you cannot avoid pain and be in pain at the same time. There can be no technique of pain management if no pain is being felt. Even in the case of pain-transcendence, some level of pain needs to be present. Any technique for coping with self-inflicted pain can only be operative when dealing with pain whilst actually *in* pain. This means that techniques of pain-transcendence can only function when one is *in* some sort of pain. The main difference between transcendence and immanence is not in the presence or absence of painful stimuli, but in the subjective perception of pain, and the way it is experienced in a particular moment. What these two-different pain-management techniques do is shift the subjective perceptual focus of pain. As a result, techniques of pain-transcendence necessarily involve distraction from pain as a principle of operation, whereas techniques of pain-immanence embody non-dualist philosophy as a principle of operation.

Last but not least, there are a few limitations that apply to this study. One limitation that is similar to most qualitative studies is in the qualitative sampling. The data used, and the findings derived from it are exclusive to the particular study contexts, and not intended for generalising beyond this sample. My hope, however, is that at the very least, the analysis of the principles of operation behind my techniques and the framework of qualitative analysis itself might be used by other practitioners

and so lead to either creating their own techniques or strengthening of the understanding of the embodiment of my techniques. The aim of this research is to analyse the researcher's experience in a reflective way, allowing the reader to make connections of their own that will subsequently help them to think about and reflect upon their own experiences. This study engages a number of skills that Somatic Practice students need to develop as reflective practitioners, as well as useful techniques/models for expanding this knowledge and applying it in practice.

This work does not set out to be a comprehensive list of techniques and methods for addressing self-inflicted pain in performance art, but is a reflective analysis of the practices that I have encountered in my research, and an attempt to assess them critically in relation to the efficacy of dealing with pain in performance. The goal here is to lay the foundations for a discourse on the technologies of self-inflicted pain in performance.

II. (Re)training: contexts and directions

'Pain is a thing of the mind. The mind can be controlled'.
Spock, Rodenberry, G. (1967). *Operation—Annihilate!*, Star
Trek, Season 2, Episode 30

In the thirtieth episode of the second season of the original Star Trek series, when attacked by some malevolent parasitic creatures that take over their hosts' bodies and make them feel pain, Spock, the First Commanding Officer of the Starship Enterprise, refuses to take painkillers. For him, pain is quintessential to his existence: without pain, he would not be the person he is; the painkillers would make him completely forget his identity and he would be subordinate to the parasitic creature that has entered his body. Spock explains that the force of the pain exercised over him by the parasite as a means of coercing him into taking painkillers, consequently forgetting who he is and enslaving himself, can easily be modulated by or in the brain. Spock's solution to the imminent threat that has taken over the spaceship is not to take painkillers but to develop a technique of appropriate mental processing that can allow him to deal with his pain. Contained within the fantastical scenario of this science-fiction television show are serious issues around the use of painkillers and the possibility for the brain to modulate the experience of pain without them. This chapter looks at these issues from the specific focus of performing arts pedagogy.

Why are special techniques needed to help performers deal with pain? And why cannot we just use painkillers? Are there not already techniques used to, for example, prepare ballet dancers to deal with the pain of wearing pointe shoes? Simply put, there is a need to address techniques of pain management in performance because there is very little discourse around this topic, and what discourse there is remains

limited in scope. Pain is too often viewed as something that needs to be concealed and hidden, with students dealing with pain on their own, or methods of pain management being passed down anecdotally from ballet dancer to ballet dancer. The development of rigorous techniques that focus on preparing performers to manage their various forms of pain, especially now that Live Art practices have turned to pain as an object of study, would fill a very critical gap in current dance and theatre scholarship and pedagogy.

Outside of theatre and performance, pain has been addressed more broadly. For example, in his book *Culture of Pain* (1991), cultural theorist David Morris explains that there is an urgency within our current societies to redefine our relationship with and perception of pain because our current perception (one that considers pain only through a medical model: something having to be administered to by doctors and treated with painkillers) is inadequate and incapable of dealing with the growing epidemic of chronic pain. ‘The epidemic of pain seems to be gaining ground. The pills in a sense just make things worse. Treatment at pain centres and pain clinics often begin with a period of detoxification in which patients gradually withdraw from the host of ineffectual and even harmful medications that they consume, fruitlessly, in hopes of relief’ (Morris, 1991: 65). Something in our understanding of pain needs to change, because when the interpretation of pain falls into the medical realm, when the cures repeatedly fail, when the medical explanations patently fall flat, and when there is no pain-killer that can help, we are once again confronted with the ever-present question of how to deal with pain.

Any discussion on how to develop a technique for performers to deal with self-inflicted pain on stage should seek to expand its discourse: firstly through investigating what pain is and how the society and its cultural stratagems have shaped

people's understanding of pain and its contexts; secondly, by identifying the ramifications and problems behind such an understanding; thirdly, by then returning to the theatrical world to bring about the desired directions for change. The sections that follow explore why our perception of pain in general needs to be re-evaluated, and will indicate which areas we need to focus on in order to build up a technique for dealing with pain in performance.

Self-inflicted pain as psychopathology and taboo

There are three models for the definition of pain: one that is psychiatric, one that is purely biological, and one that is a hybrid between culture and biology. Each of these three models comes with its own understanding of pain and how to deal with it.

The first model was developed in 1886 and is very specific in that it only concerns self-inflicted pain (and not pain in general). At the beginning of the last century, there was a spike in the scientific community claiming self-inflicted pain to be a psychopathology that needs to be treated by psychiatrists and doctors. Krafft Ebing published his book *Psychopathia Sexualis* (1886), in which he defines self-inflicted pain as a mental disorder and type of 'madness' (*Psychopathia Sexualis*, : 29). It is in that same year that the terms 'sadism' and 'masochism' are coined and defined as psychopathologies. As Byrne (2013) noted, both terms existed faintly prior to the publication of Ebing's book but their main use was to indicate a certain literary style and genre. Krafft Ebing popularised the term in scientific circles, redefining them 'as psychopathological, rather than literary categories' (Byrne, 2013: 6) and went into great detail when analysing them as such. More specifically, Krafft Ebing mentions that the term sadism, meaning 'association of active cruelty and violence', is 'named from the notorious Marquis de Sade, whose obscene novels treated of lust and

cruelty. In French literature, the expression “Sadism” has been applied to this perversion’ (Ebing, 1965: 53). Similarly, the term masochism defined as ‘the association of passively endured cruelty and violence’ (Ebing, 1965: 89) is coined from the name of another author: Leopold von Sacher-Masoch (and his famous book *Venus in Furs*). In 1892 in his book *Therapeutic Suggestion in Psychopathia Sexualis*, Albert von Schrenck-Notzing introduced the Greek term ‘alogagnia’ (from the Greek words ‘άλγος’ and ‘λαγνεία’, which mean pain and lust respectively) as an alternative to ‘somasochism’ in describing a person’s enjoyment of, and pleasure in pain. Schrenck-Notzing damned the ‘contrary sexual feeling’ as either ‘degeneration of the central nervous system’ or ‘moral decadence’ (143-144) and advocated therapy.

Sigmund Freud (the ‘father’ of psychoanalysis and arguably the most influential figure in the history of psychology and psychiatry) in his *Three Essays on The Theory of Sexuality* adopts Ebing and Schrenck-Notzing’s views, and classifies self-inflicted pain as ‘the most significant of all perversions’ (Freud, 1920: 22). From then on, self-inflicted pain is seen as needing to be treated with psychiatric pills or therapy sessions. As Alice Boulard (2001) argues ‘the psychiatric regime [...] draped a veil of modern medical science over experiences and understandings of madness. [...] The veil of modern psychiatry *made* these phenomena [deranged or psychic states as affected by the sacred and including practices of self-inflicted pain] appear [...] as mental pathologies’ (114). This transformation of understanding self-inflicted pain as a psychopathology became highly problematic; it led to a hostile environment towards self-inflicted pain, where talking about methods and practices of self-inflicting pain became taboo and a psychopathology. In my own practice, I have found a direct repercussion of this hostility to be the lack of discourse within the performing arts on how to deal with the pain that each practitioner inflicts on his/her

body as part of his/her art. I have always felt that talking about how to self-inflict pain in the arts is taboo, although in reality many art professionals are involved in self-inflicting pain but do not wish to acknowledge that. Therefore, another model for understanding pain is necessary.

The reductively biological context: two types of pain and exogenous analgesics

The second model for understanding pain, and perhaps the most dominant model within contemporary culture, is the medical one. Morris (1991), a leading scholar in the study of pain at the crossroads between medicine and humanities, explains that ‘today our culture has willingly, almost gratefully, handed over to medicine the job of explaining pain’ (19). Traditionally, according to this model, there are two types of pain: physiological (a direct response to an injury of tissues such as skin, muscles, joints, organs, bones or tendons) and inflammatory (a result of activation and over-sensitisation of the nociceptive system)³ (Wolf, 2007: 30). The biological mechanisms of these types of pain are different.

Physiological pain is reductively described as ‘a neurobiological sensory function of the brain and spinal cord’ (2007: 27) and it has three key stages: *transduction*, *transfer* and *processing* (30). Transduction occurs when an external pain stimulus such as extreme heat, a pinch, a sharp scarring object, acts upon a neural element to produce an electrical sign in a nerve cell. These nerve cells, called nociceptors or ‘pain fibres’, are highly specialised and activated only by intense, potentially damaging stimuli. At the second stage, the nociceptors transfer electrical

³ Scientists acknowledge nowadays that there is also a third type of pain: neuropathic pain, but strictly speaking it does not belong to the traditional reductively biological model because the model cannot properly explain it. This third type of pain has become a field of many new discoveries in the last few decades and will be explained in the next section, ‘From sensation to perception’.

signals from the periphery of the body to the brain, carrying the information that an external pain stimulus has been detected in a certain location at a certain time. At the last stage, the brain processes the information and decides to take appropriate action according to the gravity of the information it has received. For example, the brain might send a signal to remove the arm from the fire, otherwise the arm will get burnt (31). From this perspective, pain is a survival mechanism: it is an alarm designed to help the body defend itself against any permanent damage. This becomes more apparent in the case of a rather rare, inherited neurological condition called congenital analgesia where patients feel no pain. For example, they cannot feel the difference between warm and scalding water and therefore get burnt; their tongues and limbs get mutilated when they chew; the tips of their fingers are typically lost through repeated trauma, and so on. Their life span is significantly shortened (28). In conditions like this there is no doubt that we need pain in order to survive.

The second type of pain is inflammatory pain, which can be defined by its increased sensitivity to stimuli, which would otherwise not cause pain. A good example of inflammatory pain is acute sunburn; after having been sunburnt, taking a regular warm shower feels burning hot. The same goes for endurance-based performances, where after having performed a very simple task which on its own would not ordinarily produce any pain, the body starts feeling pain because of the many repetitions and long duration. The reason for this lies within two different mechanisms. The first one concerns the peripheral nervous system. In the event of tissue damage, the body produces a protein called VR1 within the area surrounding damage, which works as an 'early warning detection' (33). This protein increases the sensitivity of this area and reduces normal pain thresholds. The reason for this reduction is because the nociceptive system (the system that processes pain stimuli) is

over sensitised with an increased responsiveness, and as a result the threshold of pain is lowered. The other mechanism is to be found within the central nervous system itself, where scientists have noticed a change in its chemical makeup and function (33). This mechanism is called 'central sensitisation' and is the reason why patients often feel soreness in an area outside of the tissue-damaged area where there is no peripheral sensitisation. In this case, pain is no longer reflecting a specific sensory response to a pain stimulus; rather, it is rather an exaggerated response of the central nervous system to a stimulus that would otherwise not be painful at all (34). Central sensitisation can be understood as 'turning up the volume control in the sensory pathway so that stimuli that would not normally produce pain, like touching the skin, begin to do so' (33). In the case of inflammatory pain, what is normally not painful can become so. The inflammatory pain does not protect the organism from danger or further tissue damage, but rather demands the body safeguard and defend this area until the damaged tissue has fully healed.

According to the biological/medical model, the only way to deal with these two types of pain is by interfering with the biology of the body. This can be done easily by taking biochemical substances called analgesics. These biochemical substances - whether aspirin or opiates - are exogenous because they are not produced within or by the body. Instead, they are manufactured externally, outside of the body, in pharmaceutical laboratories and then infused inside the body. This is so they interfere with the transfer of noxious messages from the periphery to the brain. The perception of pain is therefore directly influenced by the use of such exogenous analgesics, employed as intermediaries between the pain stimulus and the patient during the moment of the experiencing of pain.

Since the reductively biological model for understanding pain prevails, Western current culture relies heavily on the use of exogenous analgesics. Morris (1991) explains that aspirin has in fact so firmly established itself in our culture that it is no more just an over-the-counter analgesic, but rather ‘an emblem of our immense faith in chemical assaults on pain’ (61). There is a widespread attitude that a pain-free life is something like a constitutional right (71). Of course, people in all periods of history have sought relief from pain but reality has meant that they often found little comfort in the analgesics of their times, had to suffer in silence and became hardened to pain. René Leriche (1938), a surgeon of the early 20th century, explains that

Far more than our ancestors, we try to avoid the slightest pain, however fleeting it is, because we know that we have the means of doing so. And, by this very fact, we make ourselves more readily susceptible to pain and we suffer more. Every time we fix our attention on anything we become more conscious of it. So it is in the case of pain. (56)

By so easily relieving pain with exogenous analgesics we have become more sensitive to pain. We have become more dependent on something external to our bodies, and as a result we have lost the capacity that our ancestors had to handle pain. So significant is our dependency on these drugs that scientists and cultural theorists speak today of an epidemic of painkiller addictions (Adams, 2016) with great financial costs. These medicines promise that the pain will be eradicated altogether, but the problem is that ‘pain, of course did not die. It is so far from dead that it has become a booming business’ (Morris, 1991: 65). The cost of neoliberalism⁴ means that big pharmaceutical companies have reaped massive profits by adopting egregious

⁴ Neoliberalism is defined here as an economic theory of the 20th and 21st century which can be most simply characterised in terms of promoting the idea that the economy should be freed from government. Government regulation or other interference in the market place (such as state ownership or provision of goods) should be minimised, in order to maximise efficiency. For neo-liberalists success is measured in terms of increases in economic activity (Woods, 2010: 4). More than that, it also regulates not only governmental policy but also private lives. As Peter Hall and Michèle Lamont argue, ‘neo-liberal ideas promote particular frames used by people to define how they should live their lives, what they are capable of, and for what they can hope’ (Hall and Lamont, 2013: 18).

business practices, encouraging prescription overdose; meanwhile the number of deaths related to painkillers is skyrocketing. In the USA alone, more than 183,000 people have died from overdoses related to prescription opioids between 1999 and 2015 (Centers for Disease Control and Prevention, 2016). It is undeniable that the use of exogenous analgesics as a way of dealing with pain has helped in soothing some pain and suffering, especially in the case of the terminally ill and those undergoing surgical operations. But the sole use of painkillers over long periods of time has originated new problems in relation to healthcare and pain-management, and has proven itself to be an overall inadequate method. Another model of understanding pain is therefore necessary, especially in the case of the performing arts pedagogy where the pain experienced is certainly not wholly-debilitating or connected to terminal illness.

The problem with a third type of pain: from sensation to perception

During the last few decades, scientists have been troubled by the presence and persistence of another type of pain, which is called chronic, neuropathic or pathological pain, and which the purely reductive biological model cannot explain or treat with analgesics like aspirin. In fact, chronic pain seems to be immune to painkillers. Chronic pain occurs when there might no longer be any tissue damage and as a result, the nerves send wrong signals. An example of neuropathic pain is ‘phantom limb syndrome’ where the patient feels pain in the amputated area although this body part no longer exists, many months after the amputation has taken place and the scars have healed. Where physiological and inflammatory pain both serve a function as survival-mechanisms (or in other terms, there is an adaptive reason behind them) in the case of neuropathic pain, ‘there is no adaptive function: the pain is the expression of pathology. The pain is the disease’ (34). In most of these cases, the

painful stimulus has long since disappeared but the pain remains. Being overwhelmed by pain, especially in cases of chronic pain where it can't be effectively treated with drugs, can become a paralysing and totalising experience, to the extent where patients can become disabled, or where pain takes over their personal lives, potentially leading to unemployment and family breakdown.

As a result, scientists have started looking for other reasons or models for explaining pain. They are now beginning to acknowledge that when, how and to what degree of intensity pain-sensation mechanisms are triggered is not only subject to the strength of the 'noxious,' or painful stimulus, but also, and perhaps most crucially, that pain is culturally-constructed and administered. As explained by Morris (1991) 'the experience of pain is also shaped by such powerful cultural forces as gender, religion, and social class' (20). For example, the understanding of pain in the villages of Papua New Guinea, where crocodile scarification rites of passage take place, is directly in opposition to the American Psychoanalytic Association that defines self-inflicted pain as a mental disorder that needs to be medically and psychiatrically administered (American Psychiatric Association, 2013: Chapter: Personality Disorders / Non suicidal Self Injury).

These discrepancies in the interpretation of pain indicate pain is not only a purely biochemical process in our bodies but 'rather a complex perception, the nature of which depends [...] on the affective or emotional state of the individual' (Basbaum, 1988: 86). This means that when a noxious stimulus is being processed, it is transformed from a simple sensation into the complex mental-emotional events that psychologists and philosophers call perception. 'When we understand pain as perception we are implicitly challenging the deeply mechanistic tradition in medicine that treats us as divided into separate and uncommunicating blocks called body and

mind' (Morris, 1991: 75-6). The shift from sensation to perception is very important because it helps to acknowledge that the mind and emotions can powerfully alter the perception of pain, and most importantly, it highlights the inseparable division between mind and body.

Morris, explains that 'all pain – especially all chronic pain – is an interdependent, inseparable, multidimensional union of the two elemental human forces that the Greeks called *psyche* (mind) and *soma* (body)' (Morris, 1991: 158). In this non-dualist understanding of pain, the third stage, that of processing, is essential to the interpretation of the transmitted data, and in the formation of subsequent data that will be sent from the central nervous system back to the periphery for an appropriate reaction. It is for this reason that many scientists have gone as far as to suggest that pain occurs in the brain and not in the periphery of the body. For example, the Penfield Studies are of paramount importance in understanding the role the brain has in pain and pain-perception. According to these studies, the subjective experience of pain can be reproduced in the brain without the actual stimulation of the specific peripheral body part. By stimulating the brain electronically, scientists have managed to show that pain, although felt in a specific region of the body, was actually generated in the brain. In these studies, pain is not generated at the site of injury because nothing is happening in that body part. Pain is perceived to be present at the phantom site of injury due to nerve projections (Fields, 2007: 42). Since pain is generated in the brain, it is both a neurophysiological process and a mental activity. It is mental 'in the sense that it is subjectively experienced "in" what we generally call the mind' (Fields, 2007: 43). But it is also physical in the sense that nerve cells are activated (and nerve cells and their activity are physical).

Because it is both mental and physical, any work on training pain management needs to deal with the body and the mind simultaneously. Phantom limb syndrome is a useful example that illustrates this point. Following an amputation, the patient reports pain in and presence of the lost limb even though they know the limb is not physically present. This occurs because the limb still exists within the brain's cognitive mapping of the body. The brain sends a signal to the lost limb but the limb is not there to receive it, and so no response comes back in return. Therefore, the brain resends the signal, the process repeats and thus begins a cycle resulting in an overloading of electrical signals, creating an alarming perception that this limb is malfunctioning for some reason (which is experienced as pain). It takes time for the brain to become used to the loss of the limb. Pain management has focused on tricking the brain to perceive that there is still a limb before gradually training it to accept the loss.

The fact that pain is partially culturally constructed, and that our brains are trained to process pain stimuli in specific ways, has several ramifications. It means that since we are trained to perceive pain in specific ways, we can un-train or retrain our perception of, and response to pain. Moreover, being able to un-train and retrain necessitates understanding the current culture and perception of pain, and then finding the appropriate directions for undoing those cultural inscriptions on our bodies that deal with pain perception. Because pain is processed by the brain, an organ which is the product of both culture and biology, any such (re)training needs to attend to both the soma and the psyche, a point which is pertinent to the formation of these new techniques of (re)training. These retraining techniques need to be a combination of bodily, somatic practices and practices that alter brain consciousness. By utilising the actual body as a source of change of consciousness and not the use of exogenous

analgesics, the body produces its own endorphins and manages to regulate the perception of pain internally. This shift away from pharmacologically modulated pain perception towards somatic practices that alter brain consciousness does not mean turning back the clock to a time before the discovery of how chemicals like aspirin and ether can alter our perception of pain. It is a step forward into accepting that chemical substances can alter the perception of pain, but rather than using exogenous analgesics, the focus is on building mechanisms for producing endogenous analgesics.

Choosing plasticity over flexibility

So far, this chapter has demonstrated the growing need to shift away from use of exogenous analgesics for the modulation of pain perception, and towards retraining pain perception via the facility of somatic practices that alter consciousness as their own endogenous analgesic-producing mechanisms. In what follows, I will explain in more detail how the process of retraining pain perception and avoiding pharmacologically-administered techniques of pain management is a better option because it means a) not being dependent on drugs and, more importantly, b) it allows the practitioner to reassess their own understandings of pain, including those dictated and absorbed through society and culture, and those which they might choose for themselves.

The brain's capacity to (re)train is referred to in neuroscientific terms as *plasticity*. In his *Principles of Psychology*, William James (1950) was the first scientist to describe the brain as a substance that transforms itself according to experiences and habits. He coined the term *plasticity* to describe the ability of the brain to transform. In his words:

Plasticity, then in the wide sense of the word means the possession of a structure weak enough to yield to an

influence, but strong enough to yield all at once [...] The phenomena of habit in living beings are due to the plasticity of the organic materials of which their bodies are composed. (104-105)

James linked plasticity with habits, and he explained that specific brain paths could be habilitated through repeated use. Coincidentally, his contemporary, Sigmund Freud, also spoke about plasticity but his understanding of the term was characterised by the indestructibility of the psychic life. According to him:

This extraordinary plasticity (*diese ausserordentliche Plastizität*) of mental developments is not unrestricted as regards direction [...] But the primitive stages can always be re-established; the primitive mind is, in the fullest meaning of the word, imperishable. (Freud, 1950: 14: 285-286)

For Freud, the ‘extraordinary plasticity of mental developments’ (Malabou, 2007: 82) is bound to the permanence of the psychic form. Once crafted, the psychic matter cannot go back to its previous state.

The first example could be understood as an early neuroscientific theory of plasticity, while the second one could be understood as the psychoanalytic theory of plasticity. The difference between these two theories lies in the limitations imposed upon the possibilities for plasticity and transformation. In the Freudian sense, one finds an indestructible character of psychic life whereby nothing is utterly forgotten: experiences can be modified, deformed and reformed but they persist in different phases. This means that according to Freud, our first experience of pain dictates all our subsequent experiences of pain and therefore no change in the perception of pain is possible. In the early neuroscientific sense of the term ‘plasticity’, things are different; perceptions can change and the only limitations on how much the original perception of pain can be changed are dependent on time and materiality. James writes: ‘All these changes are rather slow; the material in question opposes a certain resistance to the modifying cause, which it takes time to overcome, but the gradual

yielding whereof often saves the material from being disintegrated altogether' (James, 1950: 105). The repercussions of James' argument are that the brain can actually change shape and processes gradually.

Unfortunately, James' theory was dismissed in favour of the one proposed by Sigmund Freud, whose scientific popularity was growing and whose ideas fitted the modern discipline better. Eugene Taylor and Robert Wozniak (1996) explain that 'James found himself ignored by psychologists offended by his challenge to the very foundations of their discipline and castigated as a throwback for reintroducing philosophy into psychology just when psychology seemed to be achieving an independent status as a science' (xii). Indeed, James was interested in psychic phenomena and he would visit mediums, conduct experiments in hypnosis and automatic writing, and experiment with thought transference. As a result of dismissing James' theory, there was a consensus in the scientific community for the whole of the 20th century that the brain is physiologically static and that its structure remains largely immutable after the formative years of early childhood.

However, discoveries in the late 20th and early 21st century have actually proven and given credit to James' hypothesis that the neural pathways and synapses can be transformed due to changes in behavior, environment and neural processes. Today, the use of the term plasticity, and the way I employ it in this chapter, refers to the brain's ability to change, remodel and reorganise for the purpose of greater adaptability to new situations (Demarin, Morovic and Bene, 2014). Contemporary neuroscientific studies indicate that the adult brain can produce new neurons every single day through a process called neurogenesis⁵. These neurons are added to areas of the brain that are crucial to learning and memory, and that is how the brain is

⁵ For more information regarding the history of the discovery of neurogenesis, see Gross (2000).

constantly changing shape. Retraining ‘involves the development of entirely new circuits with new and previously unused elements, as well as the modulation of older circuits and connections’ (Gross, 2000: 72). Anatomically speaking, each neuron is connected with other neurons via synapses. Synapses are the points of contact or connection between two neurons. Marc Jeanerrod (2002), a neurologist and neurophysiologist who brought neuroscience closer to philosophy of the mind, explained that frequent use of a synapse leads to growth in its volume and efficacy, whereas a synapse used less often loses its capacity to be efficacious. This is what Jeanerrod terms ‘synaptic plasticity’, which explains how anatomically the brain changes its form during the learning process. Furthermore, the synaptic plasticity is the actual mechanism of individuation that makes each brain unique despite the commonalities held within all human brains.

The synaptic plasticity occurring during the learning process, during the development to adulthood, moulds each one’s brain. The education, the experiences, the string of circumstances make each brain a unique piece of work (63)⁶.

This transformation of the brain is even visible with the facility of MRI scanners.

Today we can trace changes in the brain that occur due to chronic pain or phantom limb syndromes (see Image 1). It is now clear and evident, even through quantitative measures, that the way we experience pain transforms our brain, our perception of our environment and response to stimuli, and hence our proprioception and sense of identity. These MRIs are a kind of ‘portrait-in-progress’, in the sense that our brains are constantly being transformed, and the outcome of such transformations are depicted by the MRI images. The MRI scanner can now draw the changes in each individual’s identity.

⁶ The original text is in French and this is my own translation.

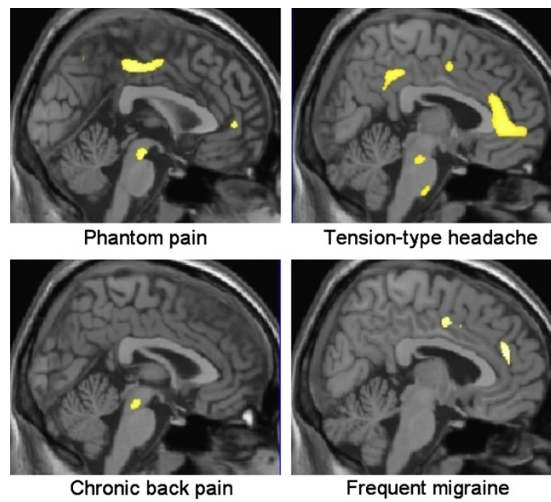


Image 1: Statistical parametric maps demonstrating the structural difference in gray matter between chronic pain patients and unaffected control subjects. Significant gray matter decrease is shown for each single group of patients, compared to matched healthy controls, and is superimposed in yellow on a normalized image of a healthy control subject. (May, 2008:12)

By developing new connections in the brain and dispensing with weaker ones (this process is known as ‘synaptic pruning’), the brain transforms and constructs not only itself but also the whole subject and its perceptions, including that of pain. Synaptic plasticity has major ramifications on our understanding of the possibilities surrounding agency of the self, meaning to decide for oneself how to form one’s own subjective identity and experience. Extended use of exogenous analgesics creates a subject that is dependent on pills, unable to decide for themselves how to deal with pain without recourse to opioids or aspirin. On the other hand, retraining and synaptic plasticity offer the individual self-determination, and the ability to form new perceptions of pain according to their will. The core difference between these two approaches is to be found in the distinction that Catherine Malabou (2008), a contemporary French philosopher, makes between flexibility and plasticity. Flexibility focuses on the ability to receive a form, to passively adapt, but not, as in the case of plasticity, to give a form, to ‘explode’ (if necessary) the given forms and create new ones instead:

To be flexible is to receive a form or impression, to be able to fold oneself, to take the fold, not to give it. To be docile, to not explode. Indeed, what flexibility lacks is the resource of giving form, the power to create, to invent or even to erase an impression, the power to style. Flexibility is plasticity minus its genius (Malabou, 2008: 12)

For Malabou, modernity currently invests in our brain's plasticity, but attempts to reduce that plasticity to functional flexibility. For Malabou, we need to exploit more of our brain's capabilities, not just of receiving but *giving* form. Etymologically speaking, plasticity comes from the Greek word *πλάσσειν* which means to mould. In plasticity, there are three inherent definitions: the ability to *receive form* (in Greek we call clay ‘plastic’), the capacity to *give form* (as in the plastic arts), and the possibility to destroy all forms (as in the French word *plastique* which is an explosive substance

made of nitro-glycerine and nitrocellulose). Plasticity is both constitutive and annihilating. As Malabou explains, ‘to talk about plasticity of the brain means to see in it not only the creator and receiver of form but also an agency of disobedience to every constituted form, a refusal to submit to a model’ (Malabou, 2008: 6). In terms of pain perception, retraining and using the brain’s inherent capacity to be plastic means undoing the given culture of pain perception and redefining your own perception of pain for yourself.

Up until the late 1980s, the scientific paradigm of biological determinism took for granted the idea that DNA constructed the individual, and that their brain (which they did consider mouldable) should be functioning *flexibly*, meaning it exists to merely accommodate needs and abilities as dictated by the DNA⁷. This also meant that since we cannot change our perception of pain, we should take pills to temporarily soothe pain, and to work *flexibly* with the pain. A radical bio-revolution emerges with the discovery of neuroplasticity, one that confers agency to our bodies: not to the point of being flexible enough to deal with pain through the duration and effectiveness of a drug, but beyond that, to the point when the individual neuron (and subsequently, the whole subject) can mould their identity, forming a new one or demolishing the one imposed on them through external forces.

A true plasticity of the brain means insisting on knowing what it can do and not simply what it can tolerate. By the verb *to do* or *to make* we don’t mean just ‘doing’ math or piano but making its history, becoming the subject of its history, grasping the connection between the role of genetic nondeterminism at work in the constitution of the brain and the possibility of a social and political nondeterminism, a new freedom, which is to say: a new meaning of history. (Malabou, 2008: 13)

⁷ For more information about a critique against biological determinism as an ideology, see Lewontin (1992).

This neuronal liberation comes with a neuronal ideology. For Malabou, retraining means bringing about a revolution which starts with a relatively small subject such as retraining pain perception, but has ramifications on a whole range of human experience. The revolution in the brain, the revolution in philosophy, the revolution in politics, the revolution in arts: all of these projects can begin with a rejection of the drug-dependent ideology of flexibility that has come to dominate the discourses of Modernity and neoliberalism. We need to train ourselves to embody the neuronal, philosophical, and political potentialities of plasticity without any reservations, otherwise we end up falling into rigidity or flexibility.

Malabou's notion of neuroplasticity is very important in understanding the purpose of retraining. Her notion of neuroplasticity functions as a revolutionary explosive aimed at the deflagration of the modern culture of pain, and the way the body has been treated and perceived in Modernity. In that sense, retraining the experience of pain is not about tolerating pain (which actually only perpetuates neoliberal economies of drug-related dependencies), it is about liberating the body from the constrictions of such an apparatus. Choosing neuroplasticity and retraining via the facility of Somatic Practices that induce Altered States of Consciousness instead of using exogenous analgesics and purely biological, deterministic definitions of pain means potentiating a nerve that has atrophied and is being stimulated once again. This is not a magical new construction, or a *deus ex machina*; the body already holds such sovereign powers that have become dormant through neoliberal culture and its perception of the body and pain. Now the task is to find Somatic Practices that can induce Altered States of Consciousness and deal with pain directly including all three different types (physiological, inflammatory and chronic).

III. Analysing performance training practices at the intersection of Somatic Practices and Altered States of Consciousness

The technique of modulating the experience of pain without the use of exogenous analgesics pertains to the intersectional field between Somatic Practices and Altered States of Consciousness. On the one hand, there is the field of Somatic Practices. Somatic Practices are physical training regimes that emphasise subjective, self-reflective perception and take a holistic view of a mind-body relationship (Eddy, 2009). Somatic Practices have long been used in the performing arts sector (especially in the field of dance) as a way of improving performers' efficiency and ease of movement (Brodie and Lobel, 2012). On the other hand, there is the field of Altered States of Consciousness, which is defined by Farthing (1992) as several mental states where the mind is conscious but in a different way to the regular mode of being awake. Altered States of Consciousness have been used in the performing arts pedagogy as a way for performers to enhance their performance skills, help them focus very strictly on their task, take risks and/or enter into an intense relationship with their character. As will become apparent, there are regular customs of using Somatic Practices and Altered States of Consciousness in the performing arts sector, but usually independently from each other; there are very few examples of marrying these two fields together. There are even fewer examples of practices that combine these two fields as a way of retraining the perception of pain. The intersection of Somatic Practices and Altered States of Consciousness as a method of pain management in the performing arts is the central focus of this chapter.

Abductive method: from framework to themes

This chapter uses the abductive method to proceed with its reasoning, as opposed to inductive or deductive methods. An inductive method would be to start with practitioners who have fused Somatic Practices and Altered States of Consciousness as a way of dealing with pain, studying and analysing their work, comparing them, interpreting them, identifying their differences and similarities in order to end up with a theory around such combinations of Altered States of Consciousness and Somatic Practices. A deductive method would be to start from a theory of how Somatic Practices and Altered States of Consciousness could be fused together in order to deal with pain in performance and then testing this theory with some specific examples from the history of performing arts.

Instead, I propose the abductive method. First, I create a framework of analysis based on the established research that has already happened so far within these two distinct fields. This framework of analysis will provide specific parameters to look at when analysing the intersection of the two fields in relation to pain management. Second, I use this intersectional framework to look at the work of some practitioners who have worked in marrying Somatic Practices and Altered States of Consciousness as a way of preparing the performer to deal with pain. Analysis of the practitioners' work should be brief and the focus should be on the parameters given from the intersectional framework. Third, I abduct patterns of practice that I call 'themes' and that emerge when studying how these practitioners meet these specific parameters of the intersectional framework. This abduction of themes occurs in two ways: across the parameters and across the artists. The aim of discovering these themes is to prepare the ground upon which the novum of my own pain management practice is based. The abductive method offers some key benefits. First, it clarifies

and validates key parameters of analysis, even before theories and patterns are developed, and guarantees the discovery of important information beyond hermeneutic interpretations. In the deductive and inductive methods, the focus on testing or developing theories impedes this heuristic process.

More specifically, in order to construct the intersectional framework of analysis, it is useful to first examine each field of practice (Somatic Practices and Altered States of Consciousness) independently. Since both Altered States of Consciousness and Somatic Practices are two distinct fields of study with their own language and epistemology, it is important to first identify the parameters that have already been used for the analysis of each field independently in order to find their common ground. For example, scientists and researchers in the field of Altered States of Consciousness usually focus on parameters such as self-control, sense of time, sense of identity and emotions⁸, whereas in Somatic Practices, discussions tend to concentrate more around matters such as goal, function and self-reflective approaches⁹. The next step is to combine these independent parameters into one unified framework capable of analysing practices that fall into the intersections of Somatic Practices and Altered States of Consciousness. The role of this intersectional framework is to offer an exhaustive analysis of all the parameters relevant to the intersection of Altered States of Consciousness and Somatics. This unified framework of analysis, with its exhaustive list of parameters, will then be used to look into specific art practices that have fused Somatics and Altered States of Consciousness as a way of dealing with pain.

⁸ For more information, see Ludwig (1990); Tart (2000); Farthing (1992); Pekala (1991); Vaitl et al (2005).

⁹ For more information see Kaparo, R. (2014); Brodie, A., & Lobel, E. (2012).

In the history of performance art and theatre contexts, Antonin Artaud, Jerzy Grotowski and Marina Abramović are three distinct and significant practitioners who were explicitly interested in dealing with pain, and whose techniques can be located at the intersection of Somatic Practices and Altered States of Consciousness. All three of these practitioners come from different eras, and their works differ vastly, but what unites them in this chapter is their attention to pain, Somatic Practices and Altered States of Consciousness. Moreover, although there is a great amount of literature on their training methods and what kind of generic acting/performing skills they produce, as of yet there has been no analysis of how the connection between Altered States of Consciousness and Somatic Practices operates, as a way of understanding how it relates or could relate to pain in the performance setting. For this reason, the analysis of these three practitioners' oeuvres will be brief and will only focus on assessing how each practitioner meets each one of the parameters of the intersectional framework. The goal is to distil the themes that occur when the aforementioned practitioners combine Somatic Practices and Altered States of Consciousness so that pain modulation is possible.

Identifying parameters within the original fields

The field of Altered States of Consciousness and their de-automatizing function

The first of the two fields studied is Altered States of Consciousness. It is less than 50 years since Altered States of Consciousness became a scientific and academic field deemed worthy of study. Charles Tart, a clinical psychologist who is known as the father of Altered States of Consciousness studies explains that in the 1960s, the scientific community believed that 'all that stuff was delusional and probably psychotic, crazy practices done by little people who sat cross-legged in the mud - and

had no scientific training at all!’ (Tart, 2011: xi). Through a systematic and very cautious effort by Tart and others working in the field, interest in consciousness shifted towards what he and Arnold Ludwig coined ‘Altered States of Consciousness’ in the late 1960s. Ludwig defined the term as follows:

I shall regard Altered State(s) of Consciousness as any mental state(s), induced by various physiological, psychological, pharmacological manoeuvres or agents, which can be recognised subjectively by the individual himself (or by an objective observer of the individual) as representing a sufficient deviation in subjective experience or psychological functioning from certain general norms for that individual during alert, waking consciousness. This sufficient deviation may be represented by a greater preoccupation than usual with internal sensation or mental processes, changes in the formal characteristics of thought, and impairment of reality testing to various degrees (Ludwig, 1966: 225).

Ludwig is suggesting that Altered States be defined in terms of an individual’s subjective experience and altered psychological function. By emphasising the subjective approach towards delineating and identifying Altered States of Consciousness, Ludwig aims to solve the scientific community’s difficulty in imposing objective criteria that designate Altered States of Consciousness. As Susan Blackmore, psychologist and researcher in consciousness explains: ‘for the moment we should be careful about defining a state of consciousness in terms of physiological variables. There is danger of losing the very essence of Altered States of Consciousness, which is how they feel for the person concerned’ (Blackmore, 2010: 363). The use of strictly quantitative data that compare daily states of consciousness to Altered States of Consciousness without paying attention to the subjective experience is dismissed in favour of the examination of qualitative changes in mental function as experienced by the individual. It is for this reason that Tart’s definition of ASC focuses on qualitative change as experienced by the subject. He claims that:

An Altered State of Consciousness for a given individual is one in which he clearly feels a *qualitative* shift in his pattern of mental functioning, that is, he feels not just a quantitative shift (more or less alert, more or less visual imagery, sharper, or duller, etc.), but also some quality or qualities of his mental processes are different (Tart, 1990: 1, Introduction to the 1st Edition 1968).

The problem with Tart's definition is that he neglected to stipulate how intense a qualitative shift needs to be or how many shifts in mental state need to occur in order to classify a state as an Altered state. Following Tart's definition, William Farthing describes Altered States of Consciousness in his textbook on consciousness as 'a temporary change in the overall pattern of subjective experience, such that the individual believes that his or her mental functioning is distinctively different from certain general norms for his or her normal waking state of consciousness' (Farthing, 1992: 205). For Farthing, it is important that the state of consciousness is compared to a 'waking state of consciousness' and he suggests observing specific dimensions of changed subjective experience, several of which need to be altered in order to be defined as an Altered State of Consciousness. Following that, several other scientists have suggested their own qualitative dimensions or parameters. In the accompanying table (see Table 1), I have compiled the different mental functions or dimensions of consciousness that have been identified by five different clinical psychologists specialising in the field of consciousness: Arnold Ludwig, Charles Tart, William Farthing, Ronald Pekala and Dieter Vaitl. Each column represents the dimensions of consciousness as classified by each psychologist. The classifications of all five psychologists have been made after conducting clinical psychological experiments on humans with regards to understanding the different modalities of the participants' conscious states. More specifically, these researchers asked their participants to express and explain qualitatively their Altered States of Consciousness. The responses were then collated and classified in specific categories such as 'disturbed time sense'

Table 1: Different dimensions of Altered States of Consciousness¹⁰

Ludwig's General Characteristics	<ul style="list-style-type: none"> • Alterations in thinking • Disturbed time sense • Loss of control • Change in emotional expression • Body image change • Perceptual distortions • Change in meaning or significance • Sense of the ineffable • Feelings of rejuvenation • Hypersuggestibility
Tart's Experiential Criteria for Detecting ASC	<ul style="list-style-type: none"> • Exteroception • Interoception • Input-processing • Emotions • Memory • Time sense • Sense of identity • Evaluation and cognitive processing • Motor output • Interaction with the environment
Farthing's Dimensions of Consciousness	<ul style="list-style-type: none"> • Attention • Perception • Imagery • Inner speech • Memory • Decision making • Problem solving • Emotions • Arousal • Self-Control • Suggestibility • Body image • Personal identity • Experience of time • Meaning
Pekala's 26 Dimensions of Consciousness	<ul style="list-style-type: none"> • Altered state of awareness • Altered experience • Body image • Time sense • Perception • Unusual meaning • Volitional control • Self-awareness • Rationality • Internal dialogue • Positive affect • Joy • Sexual excitement • Love • Negative affect • Anger • Sadness • Fear • Imagery • Amount • Vividness • Attention • Direction • Absorption • Memory • Arousal
Vaitl's Dimensions of Consciousness	<ul style="list-style-type: none"> • Activation • Awareness span • Self-awareness • Sensory dynamics

¹⁰ For the sources of this table see footnote 8

or ‘perceptual distortion’ etc.. I have set out this table that juxtaposes the different classifications of dimensions of Altered States of Consciousness in order to discern common grounds amongst the scientists. For example, Ludwig, Farthing and Pekala refer to change in self-awareness as ‘body image change’; Tart refers to it as ‘sense of identity’; Vaitl as ‘sense awareness’. There are also dimensions that some but not all of the researchers have identified; for example, only Ludwig identifies the ‘feeling of rejuvenation’, whilst ‘arousal’ or ‘sexual excitement’ is only identified by Farthing and Pekala. After comparing the different definitions of dimensions, identifying their commonalities and differences, I have then condensed the above table into one single list of dimensions. Consequently, I have managed to synthesise a single working framework of analysis. This synthesised list of dimensions contains the following grouped dimensions: (a) control, (b) suggestibility, (c) emotional expression, (d) motor output, (e) imagery / memory / attention, (f) memory, (g) sense of identity, (h) sense of the ineffable, (i) sense of time, (j) interaction with the environment. Defining each dimension and explaining how they have been formed is important in order to understand how to use these dimensions when describing and analysing an Altered State of Consciousness experience.

(a) Control. As a person enters an Altered State of Consciousness, either through the use of drugs, or a change in sensory experience, physical activity or physiological state, they often experience a sense of losing self-control, which can either prompt feelings of impotency and helplessness, or paradoxically can represent gaining greater control and power. Ludwig explains the latter experience using examples of ‘mystical, revelatory, or spirit possession states whereby the person relinquishes conscious control in the hope of experiencing divine truths, clairvoyance, “cosmic consciousness,” communion with the spirits or supernatural powers, or

serving as a temporary abode or mouthpiece for the gods' (Ludwig, 1990: 23-4). The dimension of control can also be used to describe the induction phase whereby a person may actively try to resist experiencing Altered States of Consciousness, or may welcome surrendering to the experience. Loss of control is particularly important when it comes to unveiling the deeply engrained subconscious, exposing some past experiences that have formed the subject's identity and might have been forgotten or gone unacknowledged. Especially in relation to retraining pain perception, surrendering control could possibly mean exposing past experiences that have formed the subject's relation to pain, and in doing so gives the practitioner the opportunity to acknowledge that part of themselves and focus on retraining or undoing that specific relationship.

(b) Suggestibility. This refers to the propensity of a person to uncritically respond to specific statements (for instance commands or instructions) or cues (music, temperature, etc.). This dimension is particularly present in cases of hypnosis where the individual is guided usually through words to enter into an Altered State of Consciousness. Farthing explains that 'suggestibility has to do with responsiveness to suggestions. In general terms, a suggestion is a communication from one person to another that induces the second person to change his/her behaviour or beliefs, without any argument or coercion being involved' (Farthing, 1992: 211). Suggestibility occurs when the person hands over their critical judgment on how to act on a matter to either the hypnotist or to their own emotions. A person experiencing intense emotions tends to be more receptive and therefore more suggestible.

(c) Emotional expression. With the loss of control or inhibitions, it is often reported that there is a wide change in emotional expression. Emotions can range from negative (such as fear, anger, depression, etc.) to positive (such as joy, love,

optimism, etc.). In this dimension, it is important to observe ‘sudden and unexpected displays of more primitive and intense emotion than shown during normal, waking consciousness’ (Ludwig, 1990: 24). The intensity of the emotional expression can also vary from extreme ecstasy to total apathy.

(d) *Motor output*. During Altered States of Consciousness, the ability to make complex motor actions may be disrupted. The term *motor output* refers to ‘processes for controlling our muscles and bodies that take the results of evaluations and decisions and allow us to act on them’ (Tart, 1986: 162). Examples could include speech impediment, loss of balance, ejaculation, or elimination.

(e) *Imagery / memory / attention*. Visualisations and increases in image vividness may occur during Altered States of Consciousness. Some people report an intense and very vivid experience of the current moment where perception of the reality of the here and now is heightened. Alternatively, people also report entering into dreams and/or having vivid phantasies. Sometimes these mental images may be so strong and vivid that people believe they are really happening; these are called *hallucinations*. Similarly, a person might experience a *reverie*, a free-association of thoughts or images without a coherent theme. There is also the possibility of *illusion*; for instance, when hearing a very strong wind might be perceived as hearing voices. In this case, a stimulus is misperceived and misinterpreted with the aid of the imagination.

(f) *Memory*. In Altered States of Consciousness, many people experience difficulty in recalling specific information from their past. For example, Farthing explains that, ‘during marijuana intoxication the ability to recall recent events from short term memory is impaired’ (Farthing, 1992: 209). Alternatively, some people report an improvement in their memory (some past events that were thought to have

been forgotten come to the surface of consciousness very vividly) in which case it might be difficult to ‘recall between a delusion (false belief) of enhanced recall and true hyperamnesia (better than normal memory)’ (Farthing, 1992: 209). Changes in memory are significant since they influence the way information and external stimuli are processed and analysed.

(g) *Sense of identity*. This refers to the body-image awareness each person has of themselves. For Tart, it is a ‘certain quality of information that is added to certain contents of awareness, a feeling as well as cognitive that is “This is me” — an “I!” quality that gives whatever it is added to, special priority for awareness and energy’ (Tart, 1986: 161). For example, experiencing that ‘Pavlos Kountouriotis is walking down the street’ is different to feeling that ‘I am walking down the street’. It might also be that you feel taller or shorter, or that a part of your body is bigger or smaller, lighter or heavier. Someone experiencing an Altered State of Consciousness might also feel that they are no longer themselves, since their perception of themselves no longer matches their remembered body-image. In religious settings, people often report ‘an expansion of consciousness’ or a mystical experience of ‘oneness’ (Ludwig, 1966) in which case people lose their sense of identity as a separate self and experience a ‘unity’ with God, or the universe. These changes in the perceived identity of oneself might be positive or frightening.

(h) *Sense of the ineffable*. This point refers to cases when, because of the uniquely, subjectively-experienced Altered State of Consciousness, people claim an inability to express the essence of the experience to others. This sense of an inability to describe the nature of the experience may usually be due to the varying degrees of amnesia developing during profound alterations of consciousness (Ludwig, 1990: 26).

Ineffability might also occur because some people experience language as reductive and cannot encompass the totality of the lived experience.

(i) *Sense of time.* In Altered States of Consciousness, our normal sense of time and chronology may be altered. The sense of time includes feelings of timelessness, acceleration and deceleration of time, infinitesimal duration, and interruption. Time that is measured externally and the ordinarily linear experience of time is distinctively different from the subjectively-felt time and its nonlinearity.

(j) *Interaction with the environment.* This category represents the combined functioning of several other dimensions. It refers to the way sensory processing of the external world and internal motor control is performed. For example, there might be an ‘incongruity of consequences resulting from behavioural outputs, either immediate or longer term’, or a ‘change in anticipation of consequences of specific behaviour (Tart, 2000)’, which might result in changing the direction of interacting with others or the immediate surroundings.

All of these dimensions can help in identifying when deviations from the regular, automatic state of consciousness occur. The reason why it is important to note how these dimensions may change is because deviating from automatic states of consciousness (hereinafter called de-automatization) is a highly essential component in the individual’s development of new skills. De-automatization allows the performer to enter into a new learning situation and help them refresh or acquire new skills. For example, think of the action of walking down the street, which is a habitual action that requires very little mental effort and deeper focus. De-automatization becomes necessary if, for instance, the individual has a leg injury that forces them to depart from automatic behaviour. In this case, they need to think about how to readjust their way of walking: the pace, distribution of weight and muscular engagement, otherwise

they run the risk of causing themselves a greater injury. This change of consciousness is significant for the adaptive development of the individual and it occurs via the process of de-automatization. De-automatization is the ‘the undoing of automatic processes that control perception and cognition’ (Deikman, 1982: 137) or the breaking down of the ordinary perceptual processing and cognitive patterning that were created as we grew up.

De-automatization is necessary for those cases that Stephen Gilligan calls a ‘neuromuscular lock’ (Gilligan, 2012: 26) and defines this condition as a frozen state when consciousness is stuck in a particular situation and inhibits integrative processing, meaning the ability to perceive how we are situated in this condition. The neuromuscular lock has repercussions on the individual’s development. As Gilligan explains, ‘when consciousness locks inside a state, learning and change become impossible, and problems inevitably develop. Neuromuscular lock involves both (1) a fixed brain and (2) the muscular tension to lock it in a place [...] You are locked in the contents of your fixed state, believing your map is the whole territory, while feeling isolated in a static world of disconnection’ (26). In states of neuromuscular lock, consciousness is restricted to perpetuating the same experience; the result is ‘reducing the body to an “it” to be exploited, a machine to be programmed, or a dumb animal to be coerced into action’ (89-90). An example of this would be the sound ‘ouch’ and the accompanying fear that occurs when some people are confronted with a sharp object, like a needle. While it might have been important for them to produce this sound in the past as a way to wake their own consciousness and alert themselves of an imminent threat, it doesn’t mean that this reaction is necessary. Neuromuscular lock is a state where the individual leads their life as if in a semi-awake hypnotic trance, recreating their early learning environment. De-automatization then becomes

the ‘shake-up which can be followed by an advance or a retreat in the level of organisation’ (Gill and Brenman, 1959: 178). It works by examining, questioning and re-evaluating the importance, necessity and benefit of our automatic responses to everyday stimuli.

Deikman explains that although de-automatization might seem ‘regressive in a developmental sense’ on first approach since it demands a return to the primordial state of learning rather than already knowing, ‘it is a de-automatization occurring in an adult mind, and the experience gains its richness from adult memories and functions now subject to a different mode of consciousness’ (Deikman, 1990: 46). This means that de-automatizing and retraining the performer’s perception and consciousness of pain is not a regressive, contra-evolutionary attitude; rather, it can act as an apparatus for enriching and maturing the performer’s skills.

The field of Somatic Practices and their systematising function

The second of the two defined fields for dealing with pain without the use of exogenous analgesics is Somatics. Somatics is a field of body-based practices that focuses on developing proprioception and building a sensory awareness of the body. The term ‘Somatics’ was coined in 1976 by Thomas Hanna, who sought to bring together diverse practices that had emerged in Europe and the US since the late 1800s and early 1900s. Etymologically, the word derives from the Greek word *σώμα* meaning ‘body’. Therefore, Somatics is the amalgamation of various embodied studies that pertain to the body. Somatic Practices are based on the interconnectedness of body and mind, the refusal of dualism, and approach of bringing together Eastern philosophy with body-based practices. Early forerunners of Somatics were traditional Asian practices such as Yoga (a series of bodily postures used for meditation and physical exercise), Qigong (a traditional Chinese practice that cultivates balance and

life energy) and T'ai-chi (a martial arts practice for both self-defence and wider health benefits, including longevity). Some contemporary versions of Somatics include:

- Feldenkrais Method: a type of exercise therapy devised to improve body movement and psychological states
- Alexander Technique: a practice that develops one's ability to realign posture and avoid unnecessary muscular tension
- Rolfing: a myofascial technique involving soft-tissue massage therapy
- Contact Improvisation: a dance technique that focuses on improvisational, physical contact with other bodies
- Ideokinesis: improving movement fluency through the use of guided imagery
- Authentic Movement: a type of therapy that helps people express their emotions through improvised movement
- Body Mind Centering: an exploration of all of the body's anatomical systems as a way of bringing about greater physical and spiritual awareness
- Axis Syllabys: a system of movement principles for cultivating greater awareness in alignment and management of kinetic energy
- Skinner Releasing Technique: a movement training technique for unrestricted improvised movement
- Laban Movement Analysis and Bartennief Fundamentals: sets of kinesiological principles for understanding how movement happens

As is evident, the field of Somatic Practices is quite vast, ranging from dance to spiritual practices, orthosonics and physical rehabilitation. Since they are so distinct from each other, there is no authoritative and all-inclusive method for the analysis of

Somatic Practices, but a closer study can reveal common denominators of all Somatic Practices, which I suggest using as parameters for analysis. More specifically, what all Somatic Practices share in common is the fact that (a) they all have a *goal* of changing something in the body/mind, (b) they have an *operation* through which they can achieve that goal, (c) they all take *time to change* the habitual pattern in the body/mind, and (d) they *approach* this change through the *first-person*, lived-experience. Defining each one of these characteristics is important before proceeding into an analysis of Somatic Practices and filtering out their distinctive traits.

(a) *Goal of practice*. All Somatic Practices have the goal of changing the way the body/mind is being carried. When talking about goals, we can differentiate between internal (which I call autotelic) and external (which I call heterotelic). Autotelic means that the goal of the practice is within the exercise, and achieved at the end of the exercise. For example, Alexander Technique looks at posture and promises that by the end of the class the practitioner will have corrected their posture. Similarly, Feldenkrais's autotelic goal is to release unnecessary muscular tension. In that sense, the telos of each exercise lies at the exact moment of experiencing the exercise. The goal can also be heterotelic, meaning it lies outside of the actual exercises of the practice. The purpose of the practice's existence lies outside of the practice itself. For example, in Feldenkrais, one of the goals is to achieve 'greater ease in every-day activities and increase vitality' (Feldenkrais Guild UK Ltd., n.d.). There are no exercises that deal directly with vitality, but there is empirical data to show that practitioners of Feldenkrais experience increased vitality (Stephens et al., 2005). Alexander Technique is also taught at Universities and conservatories in order to correct musicians', actors' and dancers' postures in an effort to augment their performance skills. Augmenting performance skills is a heterotelic goal of Alexander

Technique since the exercises do not focus on the students playing their instruments or reciting Shakespeare, but solely on learning how to carry their spine. Once learned, the student can bring the knowledge of how to carry the spine into the music/dance/acting class with the intention that it will help them to augment their skills.

(b) *Operation*. By operation I mean thinking beyond the procedure itself, and extending to the implementation of the procedure within a particular context. For example, Ideokinesis, a Somatic Practice for improving posture, alignment and movement fluency has a specific procedure and set of exercises, but the procedure itself operates through visualisation. Similarly, Alexander Technique operates through sensation, and Holotropic BreathworkTM through recollection and repetition. Understanding the operation behind each practice means describing the process and explaining how results come about. It is about looking at causal interactions as a way of understanding why only specific results appear and not others.

(c) *Change of time*. In all Somatic Practices, some sort of change in the body/mind occurs. The time when this change takes place has different qualities. It can be ‘synchronic’, meaning it happens only during the execution of the exercise, or ‘diachronic’, meaning it appears after a long period of time spent practicing the same exercise. The time of change might also be experienced singularly or regularly. By ‘singularly’ I mean that the experience of the exercise cannot be replicated. For example, in Holotropic Breathwork, participants’ experiences are always very different, and no similar practice is the same as any other. On the contrary, in Alexander Technique, the time when change is experienced is regular and appears in a uniform way, always at specific moments with certain qualities. The time of change might also be analysed in terms of its continuity: a continuous period of change can

be reported when the practitioner experiences the same transformation throughout the whole exercise, whereas a discontinuous time of change means that the practitioner feels that the time of change occurs between short intervals; it appears and disappears.

(d) *First-person approach*. In all Somatic Practices, change can only happen through a first-person experience, rather than an external objective observation. Observing someone sleeping cannot possibly be the same experience as sleeping. Similarly, a change during Somatic Practices cannot happen when being told by someone else what your habits are and giving you directions on how to correct them. It can only happen when the individual recognises for themselves their habitual movement and posture, and corrects it personally. There are practices that report a decrease in reflective awareness (such as Holotropic Breathwork) but healing happens through the first-person approach, and there are practices that focus and build upon self-reflection (ipso-reflexivity) and an awareness of the self-being aware of the self (meta-self-awareness)¹¹.

Somatic Practices fuse Eastern philosophies about the body-mind plexus with the goal of recognising and altering habitual behaviours (in terms of perception, posture and movement). The emphasis here is not on altering automatic functions (as in the case of Altered States of Consciousness) but on *recognising* them and developing an improved 'movement coordination that supports structural, functional and expressive integration' (ISMETA, 2013: 8). Strictly speaking then, Somatic Practices are techniques for becoming aware of the body-mind unity, and are a practical exploration of dualistic philosophies with the intention of inhibiting bad habits and directing the mind-body plexus towards psychophysical well-being.

¹¹ For more information, see Schiphorst (2009).

Many Somatic theorists have traced the birth of Somatic enquiries back to François Delsarte, who created a system of integrating movement, speech and gesture in order to enhance physical expression of emotions in the late 1800s¹². Delsarte has also been a major influence in modern dance; therefore, Somatics has always been considered a strand of dance education. Martha Eddy contends that ‘dance professionals have especially driven the development of Somatic movement and the field of Somatic Movement Education and Therapy’ (Eddy, 2009: 7). This connection had a major influence on the understanding and content of Somatics, which, like modern dance, focused on building a technique for the amelioration of the body’s capacities. Moreover, Somatics and dance share a historical epistemology of practice: mainly the first-person approach to an embodied knowledge (Schiphorst, 2009: 53). The idea of first-person methodologies is to *learn* through the experience of the self, and therefore a level of self-reflexivity and self-enactment is necessary. As Schiphorst explains, ‘based in self-observation, [Somatic Practices] use the direction of attention or awareness to re-educate perception’ (Schiphorst, 2009: 54). This process of re-education through the first-person happens through four consecutive stages: attention to habitual behaviour, suspension and pausing of habitual response, re-direction and giving focus to new qualities of movement, and finally, letting-go and putting things in action with no particular attachment to the habit or the new qualities (Depraz, Varela and Vermersch, 2003).

The most significant influence from dance is the understanding that the body can be disciplined in order to be able to move in a specific way. Consequently, Somatic Practices’ function is to systematically build up proprioception, or perception

¹² For more information, see Eddy (2009).

of the self, and selfhood by means of repetition and self-reflexivity. Systematisation is functional because it offers the possibility for gradual progression by establishing milestones at different stages of the training process, and setting targets for future development. Systematisation breaks down the practice into a logical progression of skill-augmenting exercises and guarantees efficiency in reaching the goal of the practice. In neuroscientific terms, systematisation ensures brain plasticity; the practitioner progressively recognises that the neuronal pathways that they are following can be changed and they learn how to feed new neuronal pathways, gradually strengthening new synapses and making them become the dominant pathway. For example, a person that has a lot of back problems when sat in front of a computer would be able to practice the Alexander Technique and recognise that their current neuronal directive is that once they sit in front of a computer, they curve their back, causing back pain. This realisation would gradually lead to a redirection, teaching them to stop sitting in this way by consciously thinking of sitting differently, therefore forging a new neuronal pathway which will be followed more often and gradually strengthened through the force of repetition, to the point where the previous neuronal pathway becomes weaker and is forgotten.

Themes of practice

After outlining the two main fields that constitute the non-pharmacological method of pain modulation, I now want to look at their points of intersection in order to begin developing a hybrid framework for measuring techniques that address pain in performance. More specifically, I propose synthesising the parameters of each independent field into one unified set of parameters. Accordingly, the framework of analysis that I suggest here elaborates on the following parameters: function, goal, operation, time of change, approach, control, suggestibility, emotional expression,

motor output, imagery, memory, sense of identity, sense of the ineffable, sense of time, and interaction with the environment. These parameters will be used to analyse the work of three prominent performing art practitioners whose work synthesises Somatic Practices with Altered States of Consciousness, and deals directly or indirectly with pain management. The focus is not to provide yet another introduction or interpretation of the oeuvre of each of these three practitioners, but rather to (a) briefly explain how each parameter of the intersectional framework is met in the work of these three practitioners, with the ultimate goal of (b) identifying and distilling the themes that emerge across parameters and artists, and that could potentially be useful in the creation of my own technique. For the time being, it is important to only identify these themes, and to not define them too much. Defining these themes in specific terms and exercises will constrain my own creative process of developing my techniques. By simply naming these themes without confining them in strict definitions, my goal is to identify important areas that I need to address when crafting my own technique, keeping some breathing space for freedom and creativity.

Antonin Artaud: breathing, the fear of death and the physicality of the present moment

Antonin Artaud was a seminal French, avant-garde dramatist and theatre essayist of the early 20th century. Artaud did not realise his own theories through practical work; his vision for preparing and training an actor is based on an amalgamation of Somatic investigations about breath and Altered States of Consciousness. Artaud wanted to break away from the traditional Western theatre, which he found too narrow, focusing on psychological suffering and based upon written text and language. The problem for Artaud was that Western theatre could not express adequately the real bodily experience (Murray, 2014: 148). Instead, he

advocated for a *Theatre of Cruelty* (Artaud, 1958). He explained that this cruelty 'will be bloody when necessary [...] with a kind of severe moral purity which is not afraid to pay life the price it must be paid' (122). Although he did not speak explicitly about self-inflicted pain on stage, or describe a training method for harnessing pain on stage, I am able to begin developing the foundations of a technique for retraining pain-perception in performance through a closer look at his vision, especially his descriptions of his own pain and fear of death.

Artaud didn't develop a technique for entering into Altered States of Consciousness and experiencing the world differently but his own life serves as an example of how his consciousness shifted. Throughout his life, Artaud suffered from meningitis and neuralgia, and describes these experiences as 'Hell' in his 'Fragments of a Diary from Hell' (Artaud, 1976). Artaud seemed to enter into Altered States of Consciousness not only because of the consumption of strong hallucinogenic substances but also, and more importantly, because of his excruciating and paralytic pain. He speaks of his condition as a

sickness that affects the soul in its deepest reality and that infects its manifestations. The poison of being. A veritable paralysis. A sickness that deprives you of speech, of memory, that uproots your thinking (Artaud, 1965: 21). [...] My thought seeks itself in the ether of a new dimension. I am on the moon as others are sitting at their balcony. I am part of the gravitation of the planets in the fissures of my mind' (47).

These quasi-stellar, quasi-psychoanalytic illuminations are always related to, rooted in and generated by his bodily pains. Pain is the means by which Artaud managed to enter into Altered States of Consciousness. Pain made Artaud enter into another world where he transformed this pain into a creative energy for wisdom and knowledge - something that others might consider madness, but for him, it gave him power and control.

Neither my screaming nor my fever is really mine. My secondary faculties (these elements of my mind and soul are hidden) are disintegrating, but just imagine how they are hanging on. [...] I hunger less for food than some kind of elementary consciousness. [...] This problem of the emaciation of my conscious being is no longer presented in its exclusively excruciating aspect. I feel new factors intervening in the process by which my life is being denatured, and that I have something like a new awareness of my intimate loss. I see in the fact that the die is cast and I am plunging into the affirmation of a guessed-at-truth, however risky, my entire reason for being alive. From this pain rooted in me like a wedge, at the centre of my purest reality, at the point of my sensibility where the two worlds of body and mind are joined, I learn to distract myself by the effect of a false suggestion. [...] For in the space of that minute the illumination of a lie can last, I manufacture a notion of escape; [...] I give myself the illusion of a system whose vocabulary escapes me. But from this minute of error there remains the feeling that I have snatched something real from the unknown. I believe in spontaneous bewitchments. It is impossible that I shall not someday discover a truth somewhere on the routes my blood carries me. [...] *I am stigmatised by an urgent death, so that actual death holds no terrors for me* (Artaud, 1965: 40-42) (emphasis added)

In this writing, Artaud's attention to his pain allows him to enter into some kind of Altered State of Consciousness that granted him access to a different world he had never seen before, and to discover a new truth about the world. This new knowledge permitted him to go beyond the experience of pain and help him overcome his fear of death. Artaud is actually deeply preoccupied with the importance that the fear of death has over our lives, explaining that 'there is no other issue to the purity of thought beside death (Artaud, 1986, p.38 as quoted in Shoham, 2001, p.223). But attending to his excruciating pain helps him manage to move beyond this fear where he discovers 'a new life [...] a life which is more and more profound, eloquent, deep rooted' (Artaud, 1965: 46). Artaud does not speak of a reincarnation after death, but he explains that he manages to reinvent himself through his dying body, to rebirth his own existence when he is in an Altered State of Consciousness and thinks of himself differently.

For Artaud, this new view of himself and the world is literally and metaphorically a painful experience but he suggests that it is not a place to be avoided, because it is inevitable. According to the scholar Etzel Cardena, Artaud's vision of the performer was 'as a master of the attainment and induction of Altered States with the purpose of healing a degraded humanity' (Cardena, 1986: 299). For Artaud, the role of the performer is that of a shaman: to pave the way for the spectator to travel to other worlds, to accept the imminence of death and overcome their own fears and anxieties.

The performer therefore needs to be trained to become what Artaud calls the 'athlete of the heart' (Artaud, 1958: 133). More specifically, through his experience with Balinese dancers and trips to Mexico, he postulated that through breath control, and via the facility of Somatic knowledge, the actor could cause intense psychophysiological reactions which in his own words would 'increase the internal density and volume of his feeling' and 'provoke a spontaneous reappearance of life [...] Thus with the whetted edge of breath the actor carves out his character' (Artaud, 1958: 139, 136, 137). For Artaud, every emotion is linked to a specific Somatic, physiological and musculature structure, and therefore every feeling and emotion has its own way of breathing. The role of performance art pedagogy then is to learn how to use the right breathing and physical exercises that could trigger specific emotions. By localising control of the breath, the actor manages to 'apportion it out in states of contraction and release,' thereby serving as a 'springboard for the emanation of a feeling' (Artaud, 1958: 138). For Artaud, there is a direct correlation between articulate musculature and specific emotional states, and theatre pedagogy needs to equip the actor to discover the localisations of emotions in different techniques of breathing.

Following this brief review of Artaud's visions for a training method, it is important to now turn to the intersectional framework of analysis, and investigate how Artaud's vision corresponds to each one of the framework's parameters. With regards to the *function* of his proposed technique, it is mostly de-automatizing since it demands 'a new life' (Artaud, 1965: 46), and less systematising since he did not actually develop a series of exercises but believed in the gradual development of skills. For Artaud, the training happens gradually through the process of re-learning. He explains that in his correspondences with Lewis Carroll, the famous writer, he had to 're-learn' how to write according to his interlocutor's vision of what was appropriate. But rather than beginning to write through someone else's voice, Artaud explains that to re-learn is the essence of all creative practice because it demands the undoing of a language that has been imposed upon us. In that sense, Artaud is here referring to de-automatization. The *goal* of this hybrid technique is both autotelic and heterotelic: autotelic because, whilst being within the experience of pain, it temporarily conquers death; heterotelic because the role of the performer is to 'heal a degraded humanity' (Cardena, 1986: 299) that has perhaps forgotten the meaning of pain. For Artaud, the *time when change comes* through the training is diachronic, continuous and regular (since it develops over time) and uniform since the ultimate telos is death itself. The practice brings an awareness of death and it can only happen through *first person* confrontation with one's own death or (for the audience) through affective participation. The *operation* of his approach is based on a meticulously controlled breath. The technique points towards such a finely controlled breath that it will ultimately allow the individual to lose complete *control*; in terms of *suggestibility*, the practitioner should experience being at a state of complete loss or death. Unfortunately, despite this very clear direction for controlled breath, Artaud

never consolidated his ideas into specific actions; therefore, it is very difficult to speak of *motor output* but he was certainly very fascinated by the power of controlled breathing and articulate movement, and how they produce Altered States of Consciousness. However, in relation to *imagery* and *memories*, Artaud is suspicious of the nostalgia of the past, because it distances us from the experience of the present, here and now. Leo Bersani explains that ‘Artaud’s most urgent need is to [...] save the self from any extensions [...] which would scatter and destroy presence’ (Bersani, 2004: 102). In that sense, Artaud’s training method proposes an experience that is not traveling to other images (past or futures) but emphasises the experience of the present.

In terms of *interaction with the environment*, Artaud saw the performer as a shaman that transmits spiritual energy to the audience. To that end, Artaud famously calls for an immediacy of the performer, ‘a pure presence that exceeds representation’ (Martin, 2015: Presence) as a way of grounding the self in physical presence. The *sense of identity*, therefore, must be related to this notion of energetically embodied presence. In that sense, Artaud searches to avoid a generic feeling or emotion to re-enact but rather works with what he calls a ‘unique duration’. ‘In this theatre, let's undo space, / new notion of space which we will multiply by tearing it, by undoing it thread by thread, by digging it down to the cord’ (Artaud, 1978: 252). With that expression, Artaud seems to express a desire to experience time in a singular, non-continuous, non-causal way. Moreover, William Demastes, a scholar on theatre and consciousness explains that Artaud’s shaman is invested in ‘rarefying and demystifying mundane reality’ (Demastes, 2002: 95) and endeavours to convert the *ineffable* sense of death and the fear it exerts over us into the concrete, which is pain.

By collecting all the parameters of the intersectional framework and seeing how Artaud's vision fits into these parameters, I can now abduct specific themes which will later serve as areas of focus on how to combine Altered States of Consciousness and Somatic Practices together, in order to train the performer to deal with pain in performance¹³.

The first theme that I can clearly see is a repetition among the following four parameters: operation, control, emotional expression and motor output. All four of these parameters refer to the power of *controlled breath* to produce Altered States of Consciousness. Indeed, there is a great amount of literature both in the performing arts pedagogy and in the field of pain management on the benefits of consciously regulating the breathing rhythm and cycle in order to affect the sympathetic nervous system in times of stress and pain (Brodie and Lobel, 2012: 8). It is therefore important to study and practice how to breathe in order to enter into such an Altered State of Consciousness that modulates the experience of pain.

By looking at the four parameters of goal, suggestibility, approach and sense of ineffable, I can observe another theme: the fear of death. For Artaud, the fear of pain pertains to the greater fear of death. The fear of death exerts such strong power over us and dictates our psychology and actions. By confronting his own pains, Artaud believed he was confronting his own fear of death. As Charles Segal, a classics theorist, explains 'by seeing how the smaller fears grow out of the fear of death, like branches from a central trunk, we gradually liberate our entire life from fear and from the violence, folly and suffering the fear generates (Segal, 1990: 273). The central theme identified here is about understanding that our perception of pain

¹³ For cross-reference, Table 2 provides a summary of the parameters of the intersectional framework of analysis and how the practice or vision of each of these three artists (Artaud, Grotowski and Abramović) meets these parameters.

has to do with, and is influenced by, our fear of death. According to this theme, a technique of retraining pain perception needs to also *deal with the fear of death*.

The last theme that is obvious in the two parameters of imagery / memory / attention, and sense of time is Artaud's insistence on having full consciousness of the present time. *Attention to the physicality of the present moment* means to live more intensely, which demands serious motivation and constant attention. The difficulty of concentrating on the reality of the present moment does not deter Artaud. He knows very well that the 'theatre of cruelty' that he advocates means 'a theatre difficult and cruel for myself first of all' (Artaud, 1958: 79). He writes:

I propose to renounce our empiricism of imagery, in which the unconscious furnishes images at random [...] I propose to return through the theatre to an idea of the physical knowledge. (Artaud, 1958: 79)

Instead of shifting consciousness to mental abstractions, images, ideas, thoughts and illusions, Artaud insists on focusing on the knowledge that we can acquire from the physical sensation. For Artaud, the Altered States of Consciousness that are induced by the physical action of the Somatic Practices should not create hallucinations or illusions but rather bring full attention to the actual moment.

Jerzy Grotowski: self-sacrifice, devolution, trance and meticulous articulation

Jerzy Grotowski was a Polish theatre director who emphasised the need for a training method that integrates physical and mental practice¹⁴. Grotowski developed the idea of art as a vehicle for individual and social change, and explored the role of the actor as someone who sacrifices themselves for healing purposes. Richard Schechner described Grotowski's projects as a pursuit through theatre of 'spiritual, mystical, and yogic interests' (Schechner, 1997: 465). Grotowski's work is deeply

¹⁴ For more information see Grotowski's first principle in his Statement of Principles at Grotowski (2014: 241-8).

rooted in practices of Altered States of Consciousness, and more precisely to those linked to spirituality, the numinous and the sacred¹⁵. Grotowski's idea was to use theatre as 'a tool by means of which the human being can undertake a work on her/himself' (Wolford, 1998: 88). The process for achieving this is called 'ripening' where the performer aims to enter into a state of 'connectedness with one's subconscious through the integration of the actor's psychic and bodily powers, which emerge from the intimate layers of his being and instinct' (Home-Cook, 2001: 4). Entering such a state constitutes an Altered State of Consciousness, and many people have described the experience as being in a state of trance, a dissociative state where the actor must not be conscious of his body; the body must 'cease to exist' (Grotowski and Barba, 1968: 36). Grotowski explains that this technique of the 'trance' demands a sacrifice which he saw as a revelation of the true self, regardless of how ugly or how well hidden it might be (Grotowski, 1968: 16). Etymologically speaking the word 'trance' derives from the Latin word *transire*, which means 'to go across'. It was used in ancient Rome as a euphemism for death (going across to the other world), and we understand it today as someone being unresponsive or in a dazed state. Alby Stone explains the difference between ecstasy and trance as follows: 'ecstasy is an out-of-body experience while trance is a state of sensory inactivity that resembles death' (Stone, 2003: 95). Therefore, the Grotowskian actor, just like a shaman, goes through a journey (trance) into the underworld, to encounter rather than avoid their own Hades and death. In this state, the actor experiences a complete loss of ego¹⁶, losing their control and volition just like a person who has died. At this point a spirit or a character takes possession of the actor-shaman by throwing away the current

¹⁵ For more information see Home-Cook (2001) who explains the religious and shamanistic aspects of Grotowski.

¹⁶ Ego is used here as defined by educational psychologist John Gowan as the conscious self. The loss of ego is, according to Gowan, understanding that the ego is in initial denial of possible existence of any other state of consciousness. For more information see Gowan (1987).

resident's spirit. The actor's resultant actions are involuntary. Through this trance, the actor manages to enter into a 'passive readiness to realise an active role, a state in which one does not "want to do that" but rather "resigns for not doing it"' (Grotowski, 1968: 16). This process enables the actor to perform in a specific theatrical way, but more importantly, it empowers the actor to deal with issues of not having control over one's own body and death. 'The actor's duty [is] to administer such treatment to his dedicated patients by sacrificing himself to his craft and in so doing healing his own complexes and neuroses (Home-Cook, 2001: 9). But unlike Artaud, who promised to heal the anxiety of death by accepting the imminence of death, Grotowski approaches suffering, pain, illness and death in a Catholic fashion as a 'beatitude, a triumph of spirit over flesh' (Croyden, 1974: 152). In his plays *Akropolis*, *The Constant Prince* and *Apocalypsis cum figuris*, Grotowski points to the idea of salvation through suffering (Segreda, n.d.) by proposing self-sacrifice as a way of finding meaning in one's existence. One can overcome pain and fear of death by understanding the magnitude of one's own acts in the eyes of the spectators who will be moved by the spectacle of noble suffering. According to Grotowski, this glorification of suffering leads to empowerment and annihilates the existential anxieties of the individual. If Artaud thinks of the performer as a shaman, then Grotowski envisions the performer as a martyr.

In order to arrive at this conception, Grotowski developed specific movement sequences based on his concept of '*plastiques*' and '*corporels*', a series of exercises consisting of empty physical forms that need to be animated with psychological investment. These exercises trained the actor to transcend habitual movement patterns and discover the root of their basic biologic impulses. Grotowski, influenced by yoga, focused on those Somatic areas that contain special psychosomatic energy for the

individual, mainly the vertebral column, the pelvis and the abdomen. In that sense, looking at the parameters of the intersectional framework, the *motoric output* is strictly codified and guides the *emotional expression*, which makes the *function* of the practice appear quite systematising at first glance. However, Grotowski puts an emphasis on discovering the potentials of breath, not only as vocal tool, but most importantly as a way to ‘unblock’ the voice resonators, rediscovering the voice we had as children. This means that his technique of ‘unblocking’ also *functions* as a method of devolution, de-automatizing evolution and undoing the historic normalisation and culturing of our bodies. Thus, for Grotowski, the *goal* of his training method is both heterotelic and autotelic: heterotelic because it unlocks the hidden potentials of the individual since they have become suppressed by the disciplinarian authority of our normative societies; autotelic because, as Schechner notes, the ‘basic impulse of the work is autotelic, concerned with performative elements as a tool by means of which the human being can undertake a work on him/herself’ (Schechner and Welford, 1997: 11). The *time of change* of this training is diachronic (it happens through time), continuous, regular and variable (since the goal is not to fix upon just one new expression, but to continue discovering new faces of transformation). In his training, the actor should lose their *sense of identity*, their self-awareness, and should become possessed by the spirit of the character and the character’s own subconscious. This leads to a certain self-sacrifice and loss of *control* of the self. In order to attain this level of self-sacrifice, Grotowski would frequently create ritualised encounters within nature, as a resource for people to rediscover themselves through their *interaction with the natural environment*. This possession has been described by many practitioners as a ‘double’, an ‘*ineffable* presence’ and an ‘invisible dragon’ (Fowler, 2014) that takes over the actor’s consciousness in mystical

ways. The actors then become open to the *suggestibility* of their inner psychological drives, and through the passage of time they develop a feeling of ripening. During this experience, the actor needs to return back to their archetypal *memories*, to devolve back to a *prima materia* in order to rediscover themselves through the other.

Grotowski did not explicitly develop his own technique of dealing with pain in performance settings, but following this brief intersectional analysis of Grotowski's synthesis of Somatic Practices and Altered States of Consciousness, I can observe some recurrent patterns across the parameters that I can use in the creation of my own technique¹⁷.

First of all, five of the parameters of the intersectional framework (function, control, imagery / memory / attention, sense of identity, and interaction with the environment) deal with the idea of devolution to an archetypal state, of a sacrifice of the self and a loss of ego. This theme is about *self-sacrificing and devolution to the archetype*. Grotowski believed that there are 'truths' hidden by current perceptions. The task for Grotowski is to scrape away, or dig down under these perceptions so that 'older more authentic, deeper layers [...] can be recovered and practiced (Schechner and Wolford, 1997: 492). Grotowski's method is summarised in his own words as such:

'One might say—but it is only a metaphor—that we are trying to go back before the Tower of Babel, and discover what was before. First to discover differences, and then to discover what was before the difference' (in Schechner and Wolford, 1997: 492).

In order to 'go back' Grotowski promotes a practice of perpetual abandonment or questioning of current definitions. If Grotowski were to speak explicitly about a technique of retraining pain perception, this theme could be interpreted as a call to

¹⁷ See above footnote 13 or Table 2

abandon the current perception of pain as a superficial one, and to aim towards coming closer to the original, first, raw sensations of pain, stripped away from the current cultural and social interpretations of pain.

The second theme in Grotowski's practice is to be found in the four parameters of approach, control, suggestibility and sense of the ineffable. A close observation of these four parameters shows Grotowski's insistence on trance, dissociation and being possessed. The performer can learn how to deal with pain by entering into a *state of trance* where they dissociate themselves from the actual moment and let their consciousness drift to another place / moment / experience. Grotowski differentiates between 'healthy' and 'unhealthy' trance. The test to distinguish between these two is to throw an object in front of the person in trance. If the person trips, he calls this trance 'unhealthy because the person was unaware of the space around him, whereas if he avoids the obstacle, it is considered a "healthy" trance' (Slowiak and Cuesta, 2007: 47). In other words, in a healthy trance (which is Grotowski's preference for his technique), the performer maintains attention and concentration on the action he is asked to perform, forgetting pain but always in a state of high alertness, maintaining conscious control and ready to protect himself in case of an emergency.

The last theme I can find through analysing Grotowski according to the intersectional framework is related to the parameters of operation, function, emotional expression, and motor output. In all four of these parameters, the common denominator is the strictly codified exercises of the *plastiques* and *corporels*, and the *attention required for meticulous execution*. Grotowski had an unswerving belief that mastering technique can liberate the artist. Eugenio Barba, one of his long-time students, explains that for Grotowski and for himself, 'performers who work within a

network of codified rules have a greater freedom than those who [...] are prisoners of arbitrariness and an absence of rules' (Barba, 2000: 42). There is an illuminating anecdote in the fact that Grotowski was very upset with artists such as Richard Schechner (he had just presented his work *Dionysus 69*; many years later he would also coedit the book *Grotowski Sourcebook*) who had studied very little of Grotowski's technique and tried to make some work. Robert Brustein, an American theatrical critic, recalls:

In a recent interview in *Le Monde*, Grotowski complains about the impostors who claim to have mastered his technique after completing a few exercises, and then show off the process to the public instead of completing their training—all in the name of "self expression". (Brustein, 1969: D1-3)

Grotowski believed that the benefits of a technique can only appear after systematic, methodical and concentrated study. This also implies that the performer can only enter into an Altered State of Consciousness by paying strict attention to the way they execute a somatic practice, and this concentration on perfecting the technique can become liberating. Were Grotowski to speak explicitly about pain training techniques, this liberation would be the ability to deal with pain in performance.

Marina Abramović: hyper-alertness and long durational repetitions

Marina Abramović, a seminal performance-based artist of the late 20th and early 21st century realised, just like Grotowski and Artaud, the importance of identifying and sharing methods necessary for the preparation and development of the performer's skills. Unlike Grotowski and Artaud, she developed her own training method that explicitly demands an investment in Somatic investigations, and a willingness to explore Altered States of Consciousness.

Most of the exercises Abramović has developed for her method stem from the experiments that she has practiced with her students throughout her many years of

teaching since 1979. The experiments that Abramović has conducted are influenced by her encounters with the spiritual practices of different religions, and through Somatic investigations that have developed body conditioning, sensory awareness, receptivity and memory (Richards, 2010: 115). The practices are contemplative in nature, last long periods of time, allow the mind to empty, and bring a focus to the phenomenological experience of the body within the current moment. Her understanding of Somatics augments certain aspects of proprioceptive awareness by inducing Altered States of Consciousness. For example, in her series of works titled *Cleaning the Mirror* (first performed in 1995) Mary Richards explains:

The title [...] and elements of Abramović's methodology directly relate to Tibetan Buddhism's 'emptying the mind'; a 'totally non-conceptual state of awareness' [...]. 'Cleaning the mirror' is the name Abramović gives to the process of attempting to enter this heightened state, which notionally allows those who achieve it to subsequently 'experience a heightened sense of attentional vividness' (Richards, 2010: 28).

Moreover, unlike traditional Somatic Practices, rather than trying to enforce correct anatomical and physiological states, her tasks demand the artist experience whatever comes their way as a means of letting one sink into the body rather than correcting it. For Abramović, the possibility of errors is quintessential to the work.

I have found that mistakes are a very important facet of my work. Sometimes you can't do without doing things you strongly feel you have to do, even if you know already that they are really wrong. I think that's the sort of situation where you learn the most and that helps the development of your work the most (Abramović et al., 2002: 143).

Some examples of these impossible-to-be-successful Somatic exercises that Abramović proposes are, among others: fasting from food, alcohol and tobacco; endless repetitions of one simple action and attending to the gradual degradation of the body; making the ordinary extraordinary by drastically diminishing or extending

the duration of an ordinary action; walking backwards for at least three to four hours while observing over the shoulder using a handheld mirror; and breathing deeply and emphasising the inhalation for at least two hours. These exercises allow the individual to strip away any distracting thoughts, be fully present in the moment and become aware of their body in a state of consciousness that is significantly different to the ordinary state of walking. Altered States of Consciousness are produced when attending to the enduring body's psychophysiological reactions. For Abramović (especially in her earlier works), in order to enter an Altered State of Consciousness, the performer needs to find themselves in a situation of almost endless repetitions, heightened risk, and be very much present in the moment. For instance, Abramović describes a Sufi ritual with knives:

The [Sufis] play with sharp swords in a very restricted space so that any wrong move could cause the death of somebody. For them there is not past or future, only a present that is like a trampoline from which you can make the mental jump into the other state of consciousness (Abramović and Abramović, 1998: 406)

In this quote, Abramović explains the origins of her methods for pain management. By studying these traditional rituals, she has found that in order to deal with pain, her methods have focused more on how to deal with risk-taking and becoming hyper-alert, rather than on how to deal with the pain itself. This hyper-alert state of consciousness - trying to concentrate on the here and now, of the placement, tempo and force of the knives' movements - can result in what is called peripheral hyper-alertness. This means diminished sensations at the periphery of the body, such as the arms and legs, over a sustained period of time (Ludwig, 1990: 21). Since most of the attentional resources are used to process the main activity of risk taking, there are consequently very few attentional resources to process the sensation of pain in the periphery of the body. As a result, the perception of pain is radically diminished.

The reason why Abramović takes such risks in all of her works is because of the political nature of risk taking. Facing extreme risk offers Abramović a way of being in the present, a way out of fear, which allows her to confront the situation at hand with greater clarity. Günter Berghaus's review article on the conditions of performance under Nazism explains that being in such an extreme point 'focuses attention on the absurdity of the world and it is possibly part of the liberating potential of risk and danger' (as mentioned in MacDonald, 1996: vii). Abramović's risks have a transgressive heterotelic *goal* in the sense that they break down the protective surfaces of our society and question normativity because, as sociologist and cultural theorist Deborah Lupton explains, risk taking can by definition only happen in societies with strict regulations, where the social and moral boundaries are firmly-erected in order to keep the 'polluted' people outside of the normative world (Lupton, 1999: 49). For Marina Abramović, taking risks means facing that which is feared and moving to what lies beyond this socially constructed fear.

But the goal of the practice is simultaneously autotelic since each experience is an end in itself, each experience is transformative and helps the practitioner to see 'reality in a different way' (Abramović and Jacob, n.d.: 190). Abramović puts emphasis on the de-automatizing *function of the practice* as a way to de-automatize our consciousness, and to experience reality from a different perspective. It is for this reason that Abramović says that 'it is very important not to rehearse, not to repeat, and not to have a predicted end' (Abramović et al., 2002: 27). Although Abramović downplays or even denounces the systematising aspect of her training method, it is important to note that her method functions as a systematising force since it is made out of a series of exercises that needs to be repeated in order to develop the requisite performance skills. Abramović's method is a combination of Somatic Practices and

Altered States of Consciousness, the purpose of which is to systematically and gradually transform the performer whilst in a de-automatizing mode. For Abramović, the transformation that comes about through her training happens only during the *time* of the performance. In that sense, the *time of the transformation* is synchronic, continuous, regular and variable.

Abramović's method *operates* through duration and risk-taking. It is worth dwelling here on the series of performances called *Rhythms* that were Abramović's 'research on the body when conscious and unconscious' (Abramović and Abramović, 1998: 80). During the performance of *Rhythm 2* (1974), Abramović sits in front of an audience and shows the effects of several pills in and on her body. Firstly, she uses a pill for catatonia that makes her move relentlessly for fifty minutes, then a pill for aggression that makes her smile for six hours. Abramović recalls 'there was this opposition, first not controlling my body, then controlling it' (Abramović and Abramović, 1998: 15). Similarly, in *Rhythm 0* (1974), the most quoted of all her early pieces, Abramović offers her body to be used as an object. The performance is a total surrendering of the body to the state of an inanimate, lifeless object that has renounced all of its forces. At the same time, one sees the immeasurable *sense of self* control and power she exerts when she says in the description of the piece 'during this period I take full responsibility' (Abramović and Abramović, 1998: 80). Her *motoric output* needs to remain focused and clear, but since articulation of the body is not a high priority for Abramović, it becomes evident through observation of her works that over time, a loss of muscle control, involuntary shaking and spasms, tears and muscular tension are produced. This lack of interest in the precision of the physical action also has an impact on the *emotional expression*, and very often Abramović's works are a manifestation of high drama and emotional outbursts that are exalted

because of the risk and duration of the action. In this state of endurance and risk-taking, the Abramović method demands an *approach* of meta-self-awareness that comes through focused hyper-alertness. This is consistent with the hypothesis of many evolutionary psychologists who explain that metacognition, or meta-self-awareness - thinking about thinking - is a survival tool. Being in such a state of metacognition and hyper-alertness forbids *hyper-suggestibility* and demands that Abramović continue concentrating on the action. In that sense, Abramović hands *control* of her own body over to the task. In order to survive and emerge from this self-annihilating action intact, she needs to maintain her concentration and focus on the task itself: in the case of her performance *Rhythm 10*, failure to do so would mean losing one of her fingers. When Abramović enters into this zone of high concentration and hyper-alertness there is no report (at least from the performer's perspective, not the audience's) of an *ineffable sense*, simply a strong sensation of survival.

Following this intersectional analysis of how Marina Abramović has used pain in performance, I can observe two clear themes¹⁸. The first theme is to be found in the parameters of operation, suggestibility, sense of identity and interaction with the environment. In all four of those parameters, Marina Abramović focuses on hyper-alertness and risk-taking as a way of altering consciousness to deal with pain. This theme points towards *directing all attentional resources away from pain itself and towards a risk-taking event*, and weakening the neuronal pathways that deal with the perception of pain as a result. By being hyper-concentrated and alert about one thing (in Abramović's works, it is always a risk), the performer can partially weaken the sensation of pain.

¹⁸ See above footnote 13 or Table 2

The second theme occurs across the parameters of goal, operation, imagery / memory / attention, and sense of time. These four parameters are relevant to never rehearsed before actions taking place over long durations. This theme is about *long-endured repetitions* of an action that paradoxically always feel fresh. Abramović believes that repetition has the force of a ritual:

You can start with any object and create an energy field around it again and again through ritual [...] because repetition of the same thing over and over again generates enormous power. Old cultures know this, that's why they base their entire ritual structure on repetition. 'Repetition of the same thing generates enormous power' (Abramović, 2014: 512).

For Abramović, in repeating an action over and over again, the activity takes on a life of its own and this ritual activity of repetition brings about a heightened state of awareness of the present moment. These repetitive rituals are not like most rituals about connecting with the past and the ancestors; rather, they are actions absolutely linked to the actual moment. It is about being 'at one' with the surrounding world and everybody and everyone within it.

Analysis across artists: function, approach and goal

So far, I have discovered patterns in the work of each of the three aforementioned artists that exist across the intersectional framework's parameters. The themes that I have identified so far are: (a) controlled breath, (b) confronting fear of death, (c) attention to the physicality of the present moment, (d) self-sacrificing and devolution to the archetype, (e) trance and dissociation, (f) attendance to technique and meticulous articulation, (g) hyper-alertness in order to direct attentional resources away from pain sensation, and (h) long-endured repetitions. Following this cross-parameter observation of patterns, it is now necessary to work across these artists in order to identify any patterns of practice that might be shared amongst them.

Inspecting Table 2, it is obvious that all three of the artists' practices share the same *function*, *goal* and *approach*. All three practices are both de-automatizing and systematising, are based on a first-person approach, and share goals that are both heterotelic and autotelic. This pattern of similarities is not just a theme; rather, it is the *core* of the intersection between Somatic Practice and Altered States of Consciousness. This core pattern means three things. First, with regards to function, any technique that induces Altered States of Consciousness via the facility of Somatic Practices as a means of modulating pain perception needs to function as a systematic, methodical and diachronic practice that helps the performer learn how to de-automatize habitual responses to pain stimuli. Second, with regards to approach, any technique that fuses Somatic Practices and Altered States of Consciousness can provide knowledge and transformation of pain perception through lived experience and first-person engagement only. Emphasis is placed here on tacit, embodied knowledge and practice that cannot be transmitted to another person in a verbal or written language. And third, with regards to goal, any hybrid technique of Somatic Practices and Altered States of Consciousness that trains pain perception ought to consist of exercises with both autotelic and heterotelic goals: autotelic so that during the exercise, the practitioner learns how to modulate their pain perception through the actual pain of that specific moment; heterotelic so that the exercises develop a new long-term relationship with pain, so that future pain stimuli can be interpreted using a perceptive mode that has already been retrained.

Another important pattern that emerges when examining the parameters of imagery / memory / attention is that in two of these practices (Artaud and Abramović), attention is focused on the actual moment whereas in Grotowski's practice, the performer is asked to dissociate with the current moment and enter into a

trance. This distinction is essential because it affects the relationship of the practitioner's mental state with the perception of pain. It places a clear demand on the practitioner to choose one of the two options: in the first case, the practitioner needs to keep attention on the sensation and perception of pain, whereas in the latter the practitioner shifts the perceptual attention away from the pain. If the previous pattern was core in all pain-training techniques that fuse Somatic Practices and Altered States of Consciousness, it is important because it distinguishes between two different categories of techniques based on the mode of attention. There are techniques that focus attention on the actual perception and sensation of pain, and there are techniques that demand shifting attention away from pain. As I explained in the definitions in first chapter, I call the first 'techniques of immanence' and the latter 'techniques of transcendence'¹⁹.

In summary, through examining the work of Artaud, Grotowski and Abramović through this specific lens of the combined parameters of Somatic Practices and Altered States of Consciousness, and by comparing their works, I have discovered specific patterns that I can use to craft my own hybrid technique for dealing with pain in performance. More specifically, I have found nine themes, one core and one distinguishing element. Taken together, these eleven patterns of practice propose a certain direction without confining the practice into specific exercises. I have deliberately only identified these themes, core and distinguishing elements and not yet defined them. In the next two chapters, I shall explain how I interpret these themes and elements in order to create my own technique.

¹⁹ For more information on why I am using this terminology and the origins behind it please see Chapter One.

Table 2: Comparative view of the characteristics of hybrid training methods used by Artaud, Grotowski and Abramović

	A. Artaud	J. Grotowski	M. Abramović
1. Function	Mostly de-automatization, but also systematisation	Devolution- de-automatization and systematisation through corporels / plastiques	De-automatization and systematisation
2. Goal	Heterotelic: heal a degraded humanity Autotelic: temporarily conquer death	Heterotelic: unlocking potentials (Autotelic: none)	Heterotelic: gain control Autotelic: never rehearse, the experience is in the moment
3. Operation	Controlled breath	Plastiques and corporels	Duration and risk-taking
4. Time of Change	Diachronic, continuous, regular & uniform	Diachronic, continuous, regular & variable	Synchronic, continuous, regular & variable
5. Approach	First person confrontation with one's own death For the audience, affective participation	First person approach but in a trance-based, dissociative mode (when one loses the ego and becomes someone else)	First person approach
6. Control	Localising control over physiology and anatomy to emanate feelings that will help oneself to lose control	Loss of control, self-sacrifice	Losing complete control in order to gain control over one's own body
7. Suggestibility	Experience of being at the state of complete loss or death	Possessed and open to the inner-psychological drives	Focused hyper-alertness that forbids hyper-suggestibility
8. Emotional Expression	Directly controlled and directed through breath	Produced upon demand by strictly codified body exercises	Emotional outbursts
9. Motor Output	Controlled breath and articulate movement	Plastiques and corporels strictly codify the movement to produce specific emotional expressions	Lack of articulation, muscular tension, spasms, shaking etc.
10. Imagery/ Memory/ Attention	Emphasis on the physicality of the present moment	Devolution to the archetype and trance to another world / character	Concentration on the here and now
11. Sense of Identity	Energetically embodied presence	Decreased self-awareness	Meta-self-awareness
12. Sense of ineffable	Transforming the ineffable sense of death into the concrete sensation of pain	Possessed by 'a double', 'an invisible dragon'	Intense moments of alertness
13. Sense of Time	Unique duration	Ripening over time	Endurance over long durations
14. Interaction with the environment	Shaman emitting spiritual energy	Natural environments become a resource for self-rediscovery	Hyper-alert concentration on one area and loss of consciousness in another

Table 3: Eleven themes in the intersectional analysis of Artaud, Grotowski and Abramović

A. Artaud	J. Grotowski	M. Abramović	Common amongst all three artists
(a) Controlled Breath	(d) Self-sacrificing and devolution to the archetype	(g) Hyper-alertness directing attentional resources away from pain sensation	(i) Core of the intersection: function (both de- automatizing and systematising), approach (first person), goal (both autotelic and heterotelic)
(b) Confronting fear of death	(e) Trance and dissociation	(h) Long-endured repetitions	(j) Variable: immanence or transcendence
(c) Attention to the physicality of the present moment	(f) Attendance to technique and meticulous articulation		

IV. *Whirling in Pain*: a technique of Pain-Immanence

‘Die before you die [for you will never experience death]’

Sufi Saying

Thus far, the dissertation has focused on establishing parameters upon which to build training techniques that will help the performer to deal with pain. More specifically, Chapter Two of this dissertation documented the possibility of modulating the perception of pain without the use of exogenous analgesics via the facility of Somatic Practices that induce Altered States of Consciousness. Chapter Three reviewed previous performing art practices that could possibly help train the performer to deal with pain by combining Somatic Practices and Altered States of Consciousness, although they do not explain how to do so explicitly. Through this review, the chapter identified nine themes that emerge from this combination of Somatic Practices and Altered States of Consciousness, plus one core and one distinguishing element (techniques of immanence and techniques of transcendence). Based on these findings, the next two chapters that follow expound the development of my own performance training techniques. The two techniques that I have created are: *Whirling in Pain* and *Neurobreathing*. Each chapter will address one of the two techniques; more specifically, they will elaborate on how these eleven themes have been transformed into specific principles that have guided the synthesis of my own pain-training techniques of Somatic Practices that induce Altered States of Consciousness.

The current chapter discusses the technique called *Whirling in Pain*²⁰. Strictly defining this technique based on the classifications and definitions that have appeared in this dissertation so far, *Whirling in Pain* is a non-pharmacological technique that modulates pain without the use of analgesics by fusing Somatic Practices and Altered States of Consciousness. Due to its nature and qualities, it is mostly suited to dealing with inflammatory (endurance-related) pain and chronic pain. The basic characteristic of this technique is a repetitive whirling on the spot that helps the practitioner to learn how to deal with pain in performance through focusing on, or being *in* pain, rather than averting attention away from it. For that reason, the technique's distinguishing element is that it is a technique of immanence; the practitioner dives *into* the experience of pain as a means of dealing with pain in performance. The technique is roughly based on the following themes: (a) self-sacrifice and devolution to the archetypal pain, (b) confronting the fear of death, (c) long-endured repetitions, (d) attention to the present moment, and (e) attendance to technique and meticulous articulation.

In this chapter, I introduce and expound upon the *Whirling in Pain* technique, its origins and unique characteristics. I examine its parameters and the principles that regulate its effective operation for preparing performers to deal with pain. The chapter is divided into six main sections: the first is a brief description of the *Whirling in Pain* technique, identifying its four main principles. Each of the chapter's next four sections consist of an individual analysis of those same four principles, directing particular attention to how I have adjusted and transformed them from the themes identified in the previous chapter to becoming principles that relate to pain management. This study of the *Whirling in Pain* technique's four principles leads to

²⁰ An example of how this technique has been transformed into a performance please see Appendix, Video 2.

the chapter's final section: a detailed, synthetic analysis of the technique and a qualitative, intersectional assessment based on the framework of analysis set forth in the previous chapter. This final section analyses the practice based on specific parameters (goal, function, operation, time of perceptual change, control, suggestibility, motor output, emotional expression). The final part of this chapter explains how this technique of immanence operates as a training method, and the characteristics of the training.

Description of the technique

*Whirling in Pain*²¹ is a Somatic Practice that demands the practitioner whirl on the spot for a long period of time in a specific manner. This movement induces an Altered State of Consciousness, which helps to inhibit the automatic response of pain aversion, allowing the practitioner to gradually familiarise themselves, and ultimately cope with pain instead.

The technique of *Whirling in Pain* is influenced by the long tradition of the Mevlevi Sufi Dervishes, who are most famous for their whirling dance, a form of worshipping God²². I studied this traditional, spiritual dance for two years at the Study Society of London, and after my graduation I continue to participate regularly in the spiritual ceremonies. The Study Society of London was established in 1963 by permission of the Head of the Order in Turkey. At the time, the dance was strictly forbidden and prosecuted in Turkey (birthplace of the practice and where the Head of the Order resides); very rare permissions were given out by the Turkish state and only

²¹ Because the research in this PhD emerges out of my own practice and due to the University's ethical restrictions, this technique has never been tested on other subjects other than the author of this dissertation.

²² For more information about Mevlevi Whirling Dervishes and Sufism see Friedlander et al (2003) ; Halman and And (1983).

if the dance was made for tourism purposes, not spiritual²³. Therefore, the Study Society of London became the only place where the dance was taught and studied as a spiritual ceremony, and not as a show for the tourists. I thus feel blessed to have had the opportunity to study and practice the dance in its traditional, spiritual form.

For the Mevlevi Dervishes, the purpose of their whirling practice is a religious communion with God: the turning is not about expressing emotions to an audience; rather, it is about becoming an empty vessel wherein God can enter and the communion with God be experienced. According to the tradition, this communion with God can only happen once the Dervish renounces their ego and sees themselves as part of God's creation. All elements of the practice symbolise the volitional surrender and death of the individual ego, and the subsequent awakening and union with 'The One' – their concept of God. In the Mevlevi Dervish theosophy, there is a strong belief that knowledge can be acquired through embodiment, and the Dervishes are trained so that they may learn how to open up to this learning process, relying on experience rather than reasoning. To paraphrase the common proverb, for Mevlevi Dervishes, 'practice makes knowledge'. For this knowledge to be gained, the Dervish needs to articulate the body precisely. In turning, the Dervishes demonstrate diligence towards the pursuit of precision within the movement of the feet, legs, arms, head and eyes. This meticulous anatomical articulation is maintained by force of repetition of the same movements over and over again. The objective is to whirl every time in the most technically-precise way possible. In order to achieve this, the Dervish needs to repeat and practice the technique rigorously, even outside of the ceremony. Repetition of the whirling happens not only through time (during the ceremony and also in the

²³ Legally speaking, the only permitted setting for the Mevlevi Whirling dance to happen in Turkey is for tourism purposes, and not for spiritual or religious reasons. For more information see Friedlander et al (2003).

classes) but also during the practice itself. The Dervish needs to loop each whirl continuously.

Through close study of the whirling practice's traditional format, I started experimenting with ways I could transform the practice into a performing arts training, especially with regards to pain perception. In the beginning, parallel to my spiritual practice, I whirled on my own in a dance studio as a form of meditation and relaxation. Soon it became part of my regular warming up routine. During an artistic residency in Prague at the Ponec Theatre in summer 2014, I began considering how I could adapt the practice in order for it to become a training method for dealing with pain. At the end of the residency, I presented the piece *Movement Monochromes*²⁴, which was my attempt to expose my studio practice and transformation of the spiritual practice into *Whirling in Pain*, a secular performing arts technique. It was roughly at this time that the current format of the training came into being. As such, *Whirling in Pain* is both an interpretation of the traditional Mevlevi whirling practice - one that comes out of an analysis of its components - and a targeted synthesis within my own praxis, in order to formulate a technique for dealing with self-inflicted pain in performance. I have developed the technique by (a) stripping away the religious elements of the Mevlevi whirling practice in order to facilitate a secular training method that instead focuses on aspects of Somatic Practices and Altered States of Consciousness, (b) identifying and retaining the components from the traditional practice that are most pertinent to training pain management in performance, and (c) modifying and blending these components with the themes of practices identified at the intersection of Somatic Practices and Altered States of Consciousness, so that they become principles for training the practitioner to deal with pain. Some of the

²⁴ See Appendix, Video 2

questions that arose during my attempts to secularise the technique were the following: which movement is best for helping train effective pain management? What is the symbolism behind the religious Dervish practice and how does it relate to the secular *Whirling in Pain* practice? If the Whirling Dervish is praying to God whilst spinning, what is the practitioner of the secular *Whirling in Pain* technique's state of mind? What is the role of the repetition and how can it influence pain management?

In order to answer these questions, my method was to identify the key components of the traditional practice and adjust them in such a manner that they fitted with some of the themes identified in the previous chapter. This helped me to create principles pertinent for training the practitioner to deal with pain in performance. I have chosen not to focus on characteristics of the original Mevlevi whirling training and practice such as facial expressivity, virtuosity, climactic speed or compositional structure because they are not directly related to pain-consciousness and pain-management. The characteristics I have selected in the development of my technique are: the metaphysical belief in God, the symbolism of death of the self, the relation to the body as God's vessel, and the choreographic pattern of repetition. These core components could all be uncoupled from their religious aspects and recoupled with the themes that pertain to amalgamations of Somatic Practices and Altered States of Consciousness in order to secularise them for the development of the *Whirling in Pain* technique. The forthcoming sections are structured around the following transformations: the relation of the body as a vessel of God's wisdom becomes the First Principle of *Embodied Knowledge*; the metaphysical conception around God is transformed into the Second Principle of *Inquisitive Endurance*; the symbolism of the death of the self becomes the Third Principle of *Surrendering*; and

the choreographic pattern of repetition becomes the Fourth Principle of *Sisyphean Reiteration*. Not to diminish the importance of the other aspects, but for the sake of my technique's development, I have bracketed off other characteristics of the traditional Whirling Dervishes' practice such as costume, cultural context, community support, and religious beliefs in the metaphysical sense of the practice. By explaining how I perceive these four principles to operate within the *Whirling in Pain* technique, and elucidating on how I have transformed them from their original sources by synthesising them with my pre-existing knowledge and practice, the goal is to demonstrate how these principles have become tools in the development of my hybrid technique that enables me, and hopefully others, to cope with pain.

Principle One: Embodied Knowledge

Chapter Three documented a recurring theme in Artaud's vision, which was the attention to the physical sensation of the present moment. It was explained that Artaud put a great emphasis on favouring the physical knowledge acquired when paying attention to the present moment, in comparison to shifting consciousness away from the present moment towards the construction of some imagined, mental abstraction (imagery, thought and so on). In what follows, I will explain how I have dealt with this Artaudian theme and how, when creating my *Whirling in Pain* technique, I have adjusted it to become my first principle of practice which I call: *Embodied Knowledge*.

In the context of *Whirling in Pain*, the principle of embodied knowledge refers to the need to both trust and understand that knowledge on how to deal with pain is gained through actual lived practice of pain embodiment. This means that learning how to deal with pain, and gaining the capacity to endure pain, can only really happen

via the facility of the body *in* pain itself. The body *in* pain is the sole means for attaining the (new) knowledge on how to cope with pain. Chapters One and Three documented that hybrid techniques of Somatic Practices and Altered States of Consciousness can be distinguished between techniques of immanence and transcendence. The first ones concentrate perceptual attention on the physical aspect of pain, whereas the latter direct attention away from the pain. The principle of embodied knowledge means that the technique of *Whirling in Pain* can only be a technique of pain-immanence.

The roots: from Ilm al-ishara to phenomenology and tacit knowledge

To explain the principle, it is important to trace how I have originated this principle from my traditional Sufi practice, and how I have adjusted these origins to create this principle. In Sufism, the body is exalted and becomes the means through which one comes into communion with God, and ultimately the vessel where God manifests. Since pain is a bodily sensation and function, the Sufi relationship to the body is something I need to analyse and interpret further.

Sufism is the inner, or esoteric dimension of Islam, and its teachings are centred on individual experience and personal knowledge, rather than knowledge hidden within and derived from religious texts. The mystic ceremony of the Sufi Whirling Dervishes is conceived as a way for the turner to come into communion with the divine and receive knowledge of the divine truth. Through this embodied action, the Sufis believe that this knowledge acquisition emanates only through the tacit, embodied practice and cannot be transferred to another person through written or verbal means. This is evident in several symbolic parts of the ceremony²⁵. For

²⁵ For more information see Friedlander et al. (2003) where he explains different parts of the ritual when 'intellect and action become one and existence is without boundaries' (89).

example, the *bas kesmek* – a bowing movement before entering the ceremony, translated literally as ‘cutting of the head’ - demands that the Dervishes let go of their rational minds and open up to the learning process without relying on reason. After that, the *Sheikh* takes the Dervishes on a walk around the room to show them how knowledge is manifested, and to prepare them for the lived experience: the first circle represents the knowledge gained by books; the second, knowledge gained by seeing; and the third, knowledge gained by living within reality. This emphasis on the lived experience is further reinforced through the means of silence, including the lack of any verbal communication both during the training and the actual ceremony. Even at the very early stages of the training, the teacher will demonstrate the whirling around the nail only once without talking or giving further explanation. This is to ensure that each turner will find knowledge not from the books or from the Order, but through the lived, embodied experience.

There are two kinds of learning in Islamic theosophy: knowledge that can be taught, called *ilm al-ibara*, and knowledge that cannot be taught but only alluded to, called *ilm al-ishara*. The first knowledge is descriptive and can be expressed through language, whereas the second knowledge is allusory and cannot be expressed through linguistic signification (Ahmed, 2001). The early mystic writer Ahmad Ghazal explains that ‘in the innermost heart of words are concealed the sharp edges of a sword, but they can be perceived only by inner vision’ (Ghazali, 2013: 15). For Sufis, there is always a part of knowledge that cannot be taught or communicated through language, and can only be understood via the embodiment of a lived phenomenon.

The French philosopher, Maurice Merleau-Ponty, in his book *Phenomenology of Perception* (2005) explains this type of knowledge that occurs through embodiment only. He claims that the way in which we understand and assimilate new knowledge

of a thing is not through any intellectual operation of ‘subsumption’, but by actively taking part with our bodily capacities in the experience (Merleau-Ponty, 2005).

Merleau-Ponty writes that ‘my body has its world, or understands its world, without having to make use of my “symbolic” or “objectifying function”’ (162). By emphasising the precedence of the bodily, pre-reflexive understanding over the intellectual interpretation, Merleau-Ponty rejects logocentrism because of its inability to perceive the ineffable, which precedes language and *logos*. There is a certain element of knowledge that is experienced but cannot be expressed in words.

Following Merleau-Ponty’s theory on embodied knowledge, Michael Polanyi explains in his book, *The Tacit Dimension* (1966) that we know more than we can tell. He calls this knowledge, which is not conceptualised but underlies linguistic rules, *tacit knowledge*. Tacit knowing operates on an internal plane that we are quite incapable of controlling or even feeling. Bodily awareness and perception plays a central role in tacit *cogito*. In fact, according to Polanyi, ‘all knowledge is either tacit or rooted in tacit knowledge’ (195). The role of language is to codify knowledge in order to produce new precepts that can only be further understood through a direct relation to the lived body (Collins, 2010: 6), but at the same time the problem is that this codification limits the subject of the precept. In order to gain true knowledge of a thing, and to escape language and its limitations, the knowledge of the thing needs to be perceived through the body (Merleau-Ponty, 2005: 379). To know a thing deeply means to be involved with it in a bodily manner.

The practice: a technique of pain-immanence

To come back to the *Whirling in Pain* technique that I have developed to address pain in performance, the concept of bodily knowledge as analysed before means that we know of and understand pain because of our bodies. The knowledge of

pain resides within our existing bodily intelligence and capacity. Rather than transcending or avoiding pain in order to learn how to deal with it, the gesture of immanence promotes the idea that the body must be *in* pain to learn how to deal with it. Merleau-Ponty explains this gesture of immanence as follows:

The perceiving subject must, without relinquishing his place and his point of view, and in the opacity of sensation, reach out towards things to which he has, in advance, no key, and for which he nevertheless carries within himself the project, and open himself to an absolute Other which he is making ready in the depths of his being (Merleau-Ponty, 2005: 380).

To return to Whirling, in order to acquire new knowledge about pain the practitioner needs to employ the facility of the body instead of intellectual, rational thinking. By combining the Islamic notion of *ilm al-ishara* with Merleau-Ponty's emphasis on the lived body, I have arrived at the principle of embodied knowledge, which in the context of *Whirling in Pain* means that in addition to being aware that the body will experience pain, and being aware of turning into it rather than avoiding it, in the Principle of Embodied Knowledge, the practitioner must also be prepared to embody the pain and allow the experience of pain to elucidate a new perception and knowledge of pain.

More specifically, The *Whirling in Pain* technique investigates how to deal with pain via the facility of pain itself: it is a technique of pain-immanence. It demands being *in* pain, diving into the experience of pain and finding new knowledge of pain from within. The plane of pain-immanence is practiced on two levels in the *Whirling in Pain* technique: (a) during the training, the skin around the big toe and the nail cracks, creating a large wound that is penetrated by salt, creating an even more painful stinging sensation; and (b) due to the duration of the practice (approximately 60 to 75 minutes), the circularity of the action, and the rotation on one leg only, practitioners often experience nausea, muscular fatigue and chronic pain on the left

knee which bears all the body's weight and facilitates the rotation. The practice attempts to teach someone how to deal with pain via the facility of pain itself. In *Whirling in Pain* the practitioner dives into the experience of pain in order to gradually familiarise themselves with pain, and gain new knowledge of how to interpret the pain and how to deal with it.

Principle Two: Inquisitive Endurance

In Chapter Three, I identified the theme of devolution and a return to the archetype in Grotowski's combination of Somatic Practices and Altered States of Consciousness. It was argued that if Grotowski were to speak explicitly about a technique of retraining pain perception, he would propose a practice that questions the current perception of pain, abandons it as superficial and invites us to dig down into our memories to discover the true perception of pain before it was clothed by personal experiences, culture and society. This section follows this theme and outlines the way I have transformed it into the second principle of my technique, which I call inquisitive endurance.

In the context of the technique of *Whirling in Pain*, the second principle of inquisitive endurance means that the practitioner needs to constantly remind themselves that there is more to the experience of pain than the first level of apperception, and that endurance of pain is necessary so that the whole image of the experience can reveal itself. In other words, functioning inquisitively within the experience of pain, abandoning the superficial, epiphenomenal world around us and trying to see the 'bigger picture', means constantly pursuing new knowledge that lies beyond the current confinements of what is already established.

In order to better understand the thinking behind the principle, it is important to follow the traces of its origin. In constructing this principle, I first examined the origins of the whirling practice, taking care to look at the purpose of the Mevlevi Sufi's whirling and to identify the parameters I would have to secularise. The traditional Dervish practice of whirling is a form of religious worship, a way for the Dervish to come into communion with God, and to ultimately receive their divine wisdom. Therefore, the metaphysical conception of 'communion with God' is at the core of their practice. In developing a secular *Whirling in Pain* practice, I saw this striving towards a communion with God in order to receive divine wisdom and truth as comparable to secular inquiries that aim to acquire new/other knowledge on how to deal with pain. To put it differently, I see it as a way to seek the truth of pain as it appears to the body *in* pain. My aim is to unpack the actual purpose of the *Whirling in Pain* technique, in order to better comprehend how this purpose influences the technique's other qualitative parameters.

The roots: from the nondualist notion of seeking the truth of God to the Stoic endurance

The foundations of the Sufi practice are based on Advaita Vedanta philosophy. In his book, *Rumi and Shams' Silent Rebellion: Parallels with Vedanta, Buddhism, and Shaivism* (2015), Mostafa Vaziri explains how Rumi was influenced by Advaita Vedanta and Buddhist philosophies, and how his teachings were a creative, mystical synthesis of these philosophies with Islamic religion. Advaita Vedanta is a subsect of the overarching darshana (philosophy) of Vedanta, which is itself one of the six orthodox schools of philosophical thought in India. Vedanta in Sanskrit means 'the culmination of knowledge' and the word 'Advaita' means 'non-dual', referring to the concept of a monistic and unified theory of reality (Moore and Radhakrishnan, 1989:

xvii-xxxi). Non-duality describes the singular wholeness of existence that suggests that the personal self is an illusion and that all are parts of one bigger entity (Katz, 2007: 1). According to Advaitans, the human being suffers because they are caught in a never-ending cycle of births and rebirths (called *samsara*), and the ultimate goal is to liberate themselves from this bondage and attain freedom (called *moksha*)²⁶. After birth, humans forget their previous existence as a whole entity and strive to build their self as separate beings from others, putting subject and object in opposition, and forgetting to acknowledge that the phenomenal world is an illusory construct that obstructs the self from achieving wholeness. Therefore, the goal is to free oneself from the ego (called *Fana*) by attaining knowledge of the true reality of oneness that is beyond the dichotomy of self/other (Ismail, 2008: 28). In the symbolism of the whirling practice, each rotation symbolises the endless cycles of birth and rebirth that confine the human. With every rotation, the turner seeks to understand how to end the suffering of the never-ending cycles and achieve *moksha*.

Moksha is possible by attaining knowledge beyond the illusory boundaries of the self²⁷. This knowledge does not come out of a scholastic, intellectual engagement, but rather is attained through practice and personal experience. For Sufis and Advaitans, the appearance of plurality is an illusory percept that stems from our ignorance of the one absolute reality. Overcoming this ignorance and gaining knowledge of reality beyond distinctions, dichotomies, boundaries and borders enables us to liberate ourselves from the confinements of our own mental constructions, acquiring a better and richer knowledge of the world.

²⁶ For more information see Friedlander et al. (2003); The Whirling Dervishes of London (2015); Can (2014)

²⁷ As a side-note here, Grotowski also spoke about self-sacrifice and the loss of the ego in very similar terms. For more information see Chapter Three.

Moving towards the construction of a principle that can be used in a technique that helps to deal with pain, it is important to note that Advaitan, non-dualist philosophy allows pain to be understood outside of the oppositional binaries of pain/pleasure, or negative/positive for example. According to Philip Jacobs, *Sheikh* of the London Study Society of Whirling Dervishes, and an author of Advaitan philosophy, the distinction between pain and pleasure is only a temporal, phenomenal miscomprehension of an event, and should be seen within a wider temporal context. ‘There is nothing either good or bad, but thinking makes it so’ (Jacobs, 2006: 8-9). This is an important concept for understanding that our perception of pain is limited. What might be perceived as negative pain in the first instance might at a later stage be perceived as a positive, meaningful pain. Therefore, in Advaita Vedanta philosophy, practicing endurance of pain over a long time (rather than averting from pain at the very first moment it is perceived) can lead to a wiser and more intelligent relationship with pain.

The Greek Stoic philosophers viewed enduring pain as a necessary part of living and therefore one that should not be avoided. Epictetus said ‘*ανεχου και απεχου*’ which could be translated as 'sustain and abstain' or 'bear it and stay impassive' (O'Hara, 2002: 32). The Stoic philosophy moves pain away from the dichotomy of pain/pleasure, and situates it in the discourse of knowledge acquisition. For example, in the *Enchiridion*, Epictetus elaborates on this endurance by reminding his followers to ‘not seek to have events happen as you want them to, but instead want them to happen as they do happen, and your life will go well’ (Epictetus in Morgan, 2001, p. 368). For Greek Stoics, pain is a window to knowledge and wisdom, and therefore enduring pain should be encouraged since it is a mode of learning.

The practice: pain as knowledge-eliciting

By looking at Advaita philosophy and Stoicism together, it is clear that for both philosophies the experience of pain should not be obliterated or eradicated, but rather sought after and endured as part of a holistic approach to knowledge acquisition. Rather than situating endurance of pain within the binary of positive/negative, both Advaita and Stoicism see it as a method of knowledge acquisition that assists with understanding the truth as a whole and thus achieving true happiness. This knowledge-eliciting reading of the pain experience is for both Advaitans and Stoics a means of liberation from the darkness of ignorance and limited perspective of the world.

In the *Whirling in Pain* technique, endurance of pain is not determining, constative or descriptive of an emotion, situation, or concept - as is the case with some endurance performance art practices; rather, endurance of pain is conceived and practiced as an inquisitive mode of knowledge seeking. Consequently, in the practice of *Whirling in Pain*, the inquisitive mode of endurance facilitates the dissolution of emotional expressivity; the practitioner does not aim to perform distinctive expressive states, but rather searches for ways to better understand the experience of and being in pain by accepting that his/her knowledge of pain is limited and that there is more to it. Viewed in this manner, the inquisitive mode of engagement is a de-automatizing mechanism, in the sense that it impedes the automatic habitual response of avoiding a painful stimulus. Inquisitive endurance of pain means a temporary suspension of preconceived notions of and reactions towards pain in favour of learning more about pain.

By extracting the Advaita Vedanta philosophical elements from the traditional theosophical Whirling Dervish practice, and by adjusting them to become meaningful

in the *Whirling in Pain* technique, by seeing these elements through a Stoic prism, and by practically applying the principles of Somatic Practices to them, I have repurposed this non-dualist philosophy, adapting it to the need of creating a technique that helps the performer to deal with pain. Practically speaking, that means that in the *Whirling in Pain* technique, whilst in pain, the practitioner needs to endure and pursue the pain, and to shift attention and consciousness into understanding the phenomenon of pain at the current moment. Even if the initial, automatic tendency is to avert from pain too early, the practitioner needs to endure the pain longer than the initial reaction, in search of a deeper knowledge that moves beyond the boundaries of pain/pleasure, or suffering/enjoyment. It is a mode of inquiry that is neither judgmental nor interested in coming to any hasty conclusions. Mathias Alexander, founder of the Alexander Technique, said that as a practitioner you need to ‘observe yourself dispassionately without judgment or criticism’ (Alcantara, 1997: pp. Part II, 8, Monkey against the wall). Practically-speaking, this means that if I adopt an inquisitive mode of thinking that does not rush towards judgments or answers, then the practice of endurance obtains a purpose, and therefore becomes an effective coping mechanism.

Principle Three: Surrendering

In Chapter Three, I have discovered that an important theme in Artaud’s vision was confronting the fear of death. More specifically, for Artaud it is important to overcome the fear of death because otherwise it exerts a negative influence on us. Artaud argues pain is a fragmentary experience of death, so attending to the experience of pain helps us to come to terms with and accept the imminence of death, without being afraid of it anymore. Echoing Artaud’s emphasis on pain and the need to confront the fear of death, Grotowski demanded from his actors a self-sacrifice, a

painful act of abandoning the ego and ‘permitting deeper knowledge and experience of the self and others’ (Kumiega, 1985: 143). In this section, I will explain how I have fused these two themes in the *Whirling in Pain* practice and created the Third Principle of *Surrendering*.

In the context of *Whirling in Pain*, the principle of surrendering stipulates that the practitioner can only achieve the plane of immanence by surrendering to pain, welcoming it and letting go of any preconceived ideas on how to deal with it. The automatic response to pain is usually to resist pain by creating some kind of muscular tension in the area of infliction. As I have discovered and will explain later on in this section, muscular tension exacerbates the feeling of painfulness. It is therefore considered counterproductive for training how to deal with pain. Surrendering to the experience of pain, learning how not to resist pain, means training the practitioner to inhibit the habitual, automatic action of resisting pain and to redirect attention towards the experience of pain.

The Principle of Surrendering was developed after a close study of Sufi philosophy, transformative psychology and Somatic Practices. It is therefore important to analyse, dissect and deconstruct the notion of surrender, tracing its roots in the traditional religious practice and discovering the ways in which it has become applicable to the secular *Whirling in Pain* technique.

Surrender is an important notion in Islam for the spiritual development of the believer. The word Islam itself comes from the word ‘s-l-m’ or ‘al-silm’ which primarily means ‘peace’ and ‘surrender’ (Smith, 1998: 222); consequently, the word Muslim means a person who finds peace by surrendering their life to God’s will (Glassé and Smith, 2002: 332). Islamic belief asserts that the purpose of life is to learn

to submit to God's will and obey His laws. The ceremony of the Whirling Dervishes is conceived to be a lived, embodied experience of surrendering to Allah.

In the context of the Whirling Dervishes, the notion of surrendering has multiple meanings. Surrendering can be understood in physical, behavioural, psychological, action-based and transformational terms. By analysing the different meanings of the term 'surrendering', I aim to elucidate how I have taken the notion of surrendering and processed, adapted and transformed it in order to become a guiding principle in the *Whirling in Pain* technique.

Physical surrendering: from endless spinning to the notion of avoiding ischemia

In the traditional practice of the Whirling Dervishes, turners need to continue to spin despite their fatigue and go with the momentum and flow of their centrifugal movement. Surrendering in this case means to stop resisting the flow of action. Surrendering in physical terms is also found in the somatic practice of Feldenkrais technique. Although Feldenkrais technique does not use whirling like in *Whirling in Pain*, I find that the technique has ideas that are compatible with what I am developing because it offers an anatomical and physical explanation on how to use the body. It explains that resistance creates an unnecessary muscular tension and therefore it should be avoided. Feldenkrais himself explained that:

Resistance is produced by conflicting impulses arriving at the voluntary skeletal muscles. The voluntary control is dictating one state and configuration of muscular contraction for the projected act, while the balance of the body is being maintained in a configuration incompatible with the act to be achieved. In all such cases, the body is actively prevented from adjusting itself to the better alignment by a voluntary act that the person reverts to it without ever doubting its adequacy (Feldenkrais, 2002: 112).

Accordingly, in the traditional whirling practice, resisting the flow by pausing momentarily will not bring respite from fatigue; rather, turners will lose momentum,

impede the induction of Altered States of Consciousness, and ultimately obstruct finding connection with God. While it might seem a good idea intuitively whilst nauseous or tired, resisting the flow is counterproductive because it blocks the practice and does not bring about the desired effect of coming into contact with God.

In Feldenkrais technique, resistance is resolved through realising that resisting is unnecessary. This realisation is the first step towards surrendering. Learning to recognise when and how resistance occurs is the first step to help understand when and how to stop resisting. In physical terms, the body gains more physical power when it stops resisting because it does not have to fight against itself and its own directions, maximising the output of its physicality.

By analysing the Sufi notion of surrendering in the physical terms of Somatic Practices, I aim to transform the religious meaning of the surrendering of the self and the death of the self to a principle of muscular relaxation in the *Whirling in Pain* technique. This understanding of the notion of surrendering – meaning to eschew resistance– is transformed in *Whirling the Pain* as follows: surrendering means acknowledging that resisting pain might bring about muscular tension in the area of pain, and create additional unnecessary suffering. From a scientific point of view, muscular tension produces ischemia, a tension within the muscles that compresses blood vessels and limits the supply of oxygen and fuel, which causes further pain. Scientists have proven that:

Muscle ischemia results in greater release of substance P levels, a pain neurotransmitter (neuropeptide). Increased substance P levels increase pain sensitivity. Increased pain perception results in more muscle spasm as a splinting or protective guarding mechanism, and thus the pain-spasm cycle is perpetuated (Goodman and Marshall, 2015: 30).

Avoiding muscle ischemia is relevant to the process of wounding that occurs due to the friction between the foot and the nail, a pain that is exacerbated even further through salt being applied to the wound²⁸. In this example, the goal is to release the muscles and allow more blood to flow, thereby avoiding ischemia within the muscles of the metatarsals. Ischemia needs to be avoided because it leads to an amplification of the nociceptive system's sensitisation, or the part of the nervous system that pertains to the perception of pain. Therefore, in the secular *Whirling in Pain* technique, surrendering is translated in physical terms into a principle of avoiding unnecessary muscular tension, which causes ischemia and exacerbates the sensation of pain by over-sensitising the nociceptive system.

Behavioural surrender: from the *bas kesmek* to a three-step process

Surrendering in behavioural terms can be found in the action of the *bas kesmek* -- 'cutting of the head', meaning relinquishing rational, critical thinking in favour of opening up to the lived, bodily experience (The Whirling Dervishes of London, 2015: 4). Surrendering in this case means letting go of preconceptions that create additional, unnecessary fear, and being open to new perceptions of the experience. This understanding of surrender is echoed in Robert Pirsig's famous story of the 'South Indian monkey trap'. The trap 'consists of a hollowed-out coconut, chained to a stake. The coconut has some rice inside which can be grabbed through a small hole' (Pirsig, 1974: 321). When the wild animal slips his outstretched hand into the coconut and grasps the treat in his hairy fingers, his clenched fist becomes too big

²⁸ The original purpose of the use of salt is unclear. In an online documentary, it is claimed that it is used as an antiseptic to the wound, or to toughen up the toe [for more information see ABC Australia(2005)]. From my own experience, I could add that it might partly be because it can help sense the movement of the foot on the floor and perfect the grounding of the heel better; while the foot is rotating on top of the salt, if the heel is grounded at all times, it leaves a circular pattern on the floor. If the pattern on the floor is a full circle without any interruption, it means that the turner has not lifted his/her heel from the floor.

and can't slip back out. 'The monkey is suddenly trapped'. All the monkey has to do is open his fist and his hand could easily slide out. However, his unwillingness to let go or surrender keeps him imprisoned. The monkey has in this way lost its instinctive freedom. The trap is not a physical trap; rather, it is an idea. 'The difficulty', as Keynes puts it, 'lies not in the new ideas, but in escaping from the old ones' (Keynes, 1935).

In relation to the *Whirling in Pain* technique, surrendering is a way of preparing the practitioner to live through the experience of pain by getting rid of any preconceptions of pain that would dictate specific responses to noxious stimuli. This surrender happens via maintaining an inquisitive mode towards the experience of pain, and avoiding automatic reactions to pain. It is important to look at other Somatic Practices and see how they translate the notion of surrendering in behavioural terms. To use the terminology of the Alexander Technique, surrendering can be explained as inhibiting automatic reaction. 'Inhibition in Alexander Technique means not to react habitually or automatically' (Nettl-Fiol and Vanie, 2011: 25). The aim is to learn to suspend my reflexive reactions to the noxious stimuli and to question their necessity. Additionally, it allows the practitioner to question the efficacy and even necessity of their primary response to the pain.

Following this line of thinking – from the *bas kesmek* to inhibition of automatic reaction – in the *Whirling in Pain* technique, the practitioner first needs to realise that he is reacting automatically to a pain stimulus. He then needs to temporarily inhibit his/her primary responses to pain and follow an inquisitive mode towards the experience of pain. By following this three-step process (realisation, inhibition, inquisitive endurance) the practitioner creates the space to (re)think of

his/her reaction, and intentionally redirect his/her consciousness towards being in, and coping with the actual pain.

Surrendering action-control: from the limited perception of the one to synergetic efficiency

Surrendering also means giving up control. In Islam, before birth, humans belonged to the oneness of the divine intelligence, where they will return after death. With their birth, humans forget their connection to the divine intelligence although they still are part of this oneness (Nasr, 1993: 460). Their perception is limited to their individual bodies. According to Islam, 'religion then becomes the essential means for men and women to recollect who they are and to return to their inner and primordial natures that they still carry within' (Wallace, 2002: 131). For the Islamic tradition, surrendering will to religion doesn't mean enslavement but rather, freedom:

A Muslim gains freedom and not confinement by conforming to the Divine Law, because the very boundaries of his or her being are expanded through such conformity. By surrendering to the Will of God, Muslims are able to transcend the imprisonment of their own egos and the stifling confinement of their passionate selves (Nasr, 1993: 465-66).

The belief is that the individual has a restricted and consequently distorted view of the world. Any efforts to control the situations around them are in vain since they do not have a holistic grasp of the situation. By giving away this independent, individualistic perception of the world, by renouncing control of a situation, the believer can expand their horizons and free themselves from the solitary confinements of the independent consciousness.

To conceive of this religious belief in physical terms, I will turn to an example that comes from the Somatic Practice of Contact Improvisation (since it also speaks about letting go of one's personal desires). In this example, two bodies improvise

physically and have to tune-in to each other in order to maintain contact in a smooth, consistent way. Each individual needs to give up control of the situation, understanding that there are limitations in the way the individual exercises control over the actions of the pair, and that by voluntarily relinquishing control they can maximise the output of their combined actions. If one partner wants to lift the other person, but they want to go towards the floor, the two bodies are working in opposition to each other, and therefore neither the going towards the floor nor the lifting will happen smoothly. In that sense, the principle of giving up control does not mean giving up agency; rather, it is a volitional act of letting go for the sake of synergetic efficiency. This synergetic efficiency comes about through familiarisation with the other person's intention, and the time and duration of the action is of paramount importance; in the above example of the contact improvisation couple, both dancers need to slow down the action in order to realise what the other dancer's intentions are, and so to be able to coordinate and work synergistically. Also, it means that the more occasions these two dancers have to dance together, the more familiar they become with the other person's way of moving, hence there are more chances for efficacious coordination.

This volitional surrendering of action-control over time and duration in favour of efficacy is an important principle in the *Whirling in Pain* technique. Just like in the example of the two contact improvisation dancers, the *Whirling in Pain* practitioner learns to coordinate their body with the pain; the practitioner, as the agent of self-inflicted pain, suspends primary self-defence against the wounding action and embodies the pain, continuing to move and relinquishing primary control of the body's actions. This suspension of primary self-defence happens gradually rather than abruptly, since the act of wounding and other pain-inducing actions accumulates

gradually. This accumulation is what enables the practitioner to familiarise themselves with pain, letting go of any need to control the situation and defend the self. Although self-defence can provide a useful sense of self-preservation, it is important to realise that it might also be a limitation. In my experience, by partially relinquishing this control, I manage to find the physical and emotional reserves (that I did not know that I had before) to withstand, tolerate and cope with pain. The technique suggests a surrendering in terms of action-control, which means abandoning usual coping mechanisms in order to maximise efficiency, and in so doing discovering reserves and coping mechanisms that have lain dormant within. Viewed from this perspective, giving up self-defence and control of a painful experience is not a weakening of the body or the self, but rather a form of empowerment where the practitioner is able to discover and expand their pain thresholds and pain coping mechanisms. This happens through *Whirling in Pain* in a gradual fashion, where the pain also accumulates gradually through the passage of time, giving the practitioner space and time to familiarise themselves with the pain and learn how to respond synergistically with, rather than against the pain.

If surrendering control and handing it over to religion leads to freedom rather than enslavement for the Sufi Dervish, in the secular terms of the *Whirling in Pain* practice, it means that surrendering control of pain leads to empowerment and knowledge-expansion of my bodily capacities and coping mechanisms. This surrendering of control as an empowering gesture happens by becoming familiar with the pain gradually, relinquishing desire to control the pain, working synergistically with it in order to discover how to cope with the pain. The quest is not to avert oneself from pain, but rather, with the facility of time, to coordinate with pain in order to find the hidden reserves that help one cope with pain.

Psychological surrender: from death of ego to letting go of perceptions

Another way to understand surrendering in the traditional religious practice of the Whirling Dervishes is to consider it in psychological terms, especially since many parts of its symbolism are about such psychoanalytical terms as the death of the ego and the self. The whirling practice itself is conceived of as symbolising the death of the individual's ego; an awakening with the One, the volitional surrender of one's individuality to God and religion. The costume is also symbolic; the robe itself is the shroud, the hat is the tombstone. There is a Sufi hadith, which says '*mutu qabla an tamutu*', meaning 'die before you die [for you will never experience death]' (Schimmel, 1993: 324). In his doctoral dissertation on the psychology of surrendering Gordon Wallace (2002) explains that the recurrent theme of the death of the self in Sufi symbolism and theosophy can be interpreted as letting go of the 'false beliefs attached to the permanency and importance embedded in the objects of our desires. The awareness of self-centred craving presents an opportunity to let go, as understanding matures into surrender' (Wallace, 2002: 86). Therefore, there is a voluntary relinquishing of belief in the self in order to establish a relationship with what seems at first sight to be an external entity—God. But, for Sufis, this relationship is one that already exists within the individual; God is not external, but rather resides in all of us, and the body is the vessel where God can be found. It is with attention, devotion and regular practice that the Whirling Dervish can re-establish that relationship with the God already inside of us.

This belief in deep-listening to the body's internal wisdom and paying attention to what the body already holds and knows can also be found in the secular world of Somatic Practitioners such as Bartenieff, Feldenkrais, Rolf, Selver and Faust. In both the religious and secular/somatic notion of surrendering there is a 'movement

from understanding the individual and his or her world through what can be characterized as the narrow myopic lens offered solely by the ego, to a larger, more expansive view' (Wallace, 2002: 245). In the case of the Whirling Dervishes' religious world, this opening up of horizons is offered by God, whereas in the case of Somatic Practice it is achieved by paying attention to the experience of the body. In this gesture from the religious to the secular, the key focus is the dropping of the culturally constructed body and constructed perceptions in favour of listening to the internal bodily, physical, anatomical and biological experience.

In terms of the *Whirling in Pain* practice, understanding surrender in psychological terms means recognising that the perception of pain is partially culturally indoctrinated and that it is necessary to listen to the body's reactions to the pain in order to re-establish a new, fresh relationship to pain. Accepting that automatic response to pain is not only a physical reaction but one that is also culturally saturated by our daily experiences and practices of our identity is an important step in the *Whirling in Pain* technique. Surrendering in psychological terms means understanding that preconceptions of pain have been culturally engrained in the daily practices of identity and that it is not only a matter of temporarily changing behaviour in relation to pain, but rather a whole process of self-transformation. Since the sum of our perceptions is the result of the self, surrendering in psychological terms in the context of *Whirling in Pain* means letting go of the self and all of its perceptions of pain.

Transformative surrender: from rite of passage to dissolutions of previous perceptions of pain

This final definition of the term 'surrendering' is in fact a culmination of all the previous ones. Since surrendering demands not only changing physical responses

to pain, but also changing attitudes towards it, dropping control and by extension, challenging the individual's formed identity (particularly in relation to culturally prescribed perceptions of pain), surrendering can be thought of as a transformative process. In the traditional religious Mevlevi practice, the Dervish learns to open up his heart and listen to God's knowledge, which brings about a gradual transformation. The whirling ceremony is considered as an important rite of passage where the turner has the ability to temporarily leave behind the human confinements and enter into the oneness of the divine wisdom. There is therefore a strong belief that the communion with God can gradually alter and transform the self.

Clinical psychotherapy has recently embraced the operation of transformative surrendering as an integral part of human developmental experience²⁹. Wallace defines transformative surrendering as 'the act of letting go or giving up real or symbolic aspects of one's self through either a voluntary or non-volitional process in order to maintain or re-establish a transpersonal relationship but without foreknowledge of the actual outcome' (2002: 59) and adds that it is a 'serial experience initiating significant growth and developmental transitions throughout an individual's life journey' (3). In that sense, the time of change is not necessarily immediate, nor is there an instant occurrence; rather, physical, behavioural, psychological and control surrendering mark an initiation point: 'with the dissolution of previous conceptions of personal identity the redemptive process is ready to begin: there is an opportunity for a new being to emerge from the rubble of the former self' (Hidas, 1981: 31). More specifically, in the *Whirling in Pain* technique, the operation of surrendering to the experience of pain is a practice, the full transformative results of which might not be directly sensed but demands from the practitioner a trust that in

²⁹ For a survey of in-depth psychological theories that involve transformative surrender see Wallace (2002).

time transformation will appear. The transformative benefit of surrendering to pain can be traced in pain's capacity to be a liminal stage, a stage of passage and transformation.

In *Whirling in Pain*, the practitioner focuses on the experience of pain, and through the force of endless repetitions enters into an Altered State of Consciousness where time is erased and a lacuna is created. Mark Epstein, an American psychologist who integrated Buddhist philosophy into clinical psychology explains that during the experience of deep meditation when time disappears, the knowledge that comes with and because of it also escapes, and one finds oneself in a moment of 'unknowing'. These moments of unknowing, when 'the mind is loosened from its moorings' (Epstein, 1998: 46) are said to be special opportunities for transformation and self-realisation. It is a moment that invites possibilities or potentials to unfold. *Whirling in Pain* is therefore a practice of liminality where time is suspended and the practitioner exercises their capacity to deal with pain by both surrendering to and being *in* pain. Immanence, learning to be in pain, is only possible when surrendering: by avoiding physical tension, challenging preconceptions of pain, dropping control over pain and inhibiting automatic responses to pain, the practitioner manages to surrender, and hence transform their approach to (and ultimately cope with) pain.

Principle Four: Sisyphean Reiteration

One of the main characteristics of the *Whirling in Pain* practice is its relation to time and the long, undifferentiated repetition of the whirling. This notion of repetition has its roots in the Islamic tradition of *zikr* and has been influenced by the Western philosophical notion of repetition as proposed by philosopher Søren Kierkegaard. Repetition is also a theme that was discovered in Chapter Three when

looking at Abramović's work, where it was shown that for Abramović, repetition brings about an Altered State of Consciousness that allows for heightened awareness of the present moment. In this section, I will critically analyse the origins of the notion of repetition and how I have combined them in *Whirling in Pain*, in order to create the fourth and last principle of Sisyphean Reiteration. The goal is to comprehend how repetition operates within the technique and how it influences the qualitative output of the practice.

The roots: from *dhikr* to Kierkegaard

In Islamic theology, repetition is an expression of an important Sufi notion called *dhikr* or *zikr*. Dhikr is the most frequently used form of prayer in Islamic mysticism and is a repetitive recitation of a sacred formula. The definition of the word lies somewhere between 'memory' and 'repetition of what is known but forgotten'; dhikr can mean 'mention', 'recollection', 'evocation' and 'memory'. According to Jusuf Sali, an Islamic scholar:

Muslim mystics believe that people are directed away from the nucleus of their being and that their consciousness is imprisoned in some kind of delusion and forgetfulness (*ghafla*). Therefore, they should "remind" (*dhikr*) and be reminded constantly so that they will "remember" what they have "forgotten" (Salih, 2010: 51).

Even the Qu'ran refers to itself by the term *dhikr* and the Prophet himself was a 'reminder'. Thus, *dhikr* is the remembrance of God by force of repetition. By repeating the turn over and over again, the Mevlevi Dervishes aim to remember how it was to be one with their God. Repetition is thus conceived in close relation to memory and as a way to go back in time. This understanding of repetition is closely related to the Platonic idea of *anamnesis*, which Plato used to explain how we acquire new knowledge. Socrates explains:

A man cannot search either for what he knows or for what he does not know [...] He cannot search for what he knows--since he knows it, there is no need to search--nor for what he does not know, for he does not know what to look for (Plato, 1980: 880, 80e).

In other words, there is no point in trying to research something that you already know and conversely, you cannot even begin researching something if you haven't already come across it. Socrates' response to this problem was to develop the theory of *anamnesis*, stating that the soul is immortal and reincarnated repeatedly (Plato, 1980: 86b). 'Learning' is actually recovering knowledge of what one already knows but has forgotten. The process of learning is thus devolving, going backwards rather than forwards - these directions must be understood temporally rather than spatially.

In my move from the religious whirling practice to the secular *Whirling in Pain* technique, I propose thinking of this devolution as an act of undoing the cultural inscriptions on the body, rather than thinking of it as a mystical return to the wise God. Such a suggestion is in line with Somatic Practices such as Authentic Movement, Feldenkrais, Alexander Technique, Axis Syllabus, or Body Mind Centering³⁰, which believe in a wise body that has forgotten or put aside its wisdom due to the way the society wants people to behave. Frey Faust, founder of the Axis Syllabus writes that:

In most of the occidental world these traditions
[strengthening the body as well as refining coordination]
have been eroded or lost entirely, giving rise to a largely
inactive population (Faust, 2011: 16).

In all of these Somatic Practices, there is distrust in contemporary knowledge around the body (especially with regards to what is possible of and desirable for the body) and how it is articulated *on* the body. Consequently, there is a strong desire for returning to the body shorn of its cultural inscriptions. For example, in his observation

³⁰ All of these Somatic Practices have briefly been introduced in the previous chapter

with human infants, Feldenkrais discovered that babies ‘learning the “special movements of our repertoire” is what typical infants do so beautifully in the first year of life, and then undo in unconsciously learned habits of muscular tension as they experience “promise of great reward or intense punishment” through accidents or social interactions later in life’ (Reed and Stephens, 2002: 124-5). Feldenkrais finds that initially infants are fully attentive to sensations, but then due to ‘rewards’ or ‘punishments’³¹ they very soon adopt the action that is most rewarding or less punishing. In that way, the mental capacity for being attentive and open to learning begins weakening. Therefore, for the Somatic Practitioner, knowledge acquisition is immanent in the sense that one does not need to seek knowledge outside of themselves, in texts or books for instance, but rather one should discover it within their own body. For example, Feldenkrais practitioners learn how to bring awareness and curiosity to their bodies by means of repetition and observation. In verbally-guided Awareness Through Movement group lessons, participants are instructed to repeat movements many times, and observe whether they are putting excessive, unnecessary tension into their movement or posture through a process of trial and error. For the Feldenkrais practitioner, repeated movements are used as a testing ground (the trial and error process) for challenging and undoing their previous way of moving.

In the *Whirling in Pain* technique, repetition is used in a way that can (a) help the practitioner undo the conceptions of pain that have been formed and codified by society and/or their own previous experiences of pain, and (b) unleash the hidden potentialities within the body. In this process of devolutionary immanence - meaning going back to the body shorn of its cultural inscriptions in order to learn how to deal with

³¹ Reward and punishment are two terms that I will define in Chapter Five.

pain by being *in* pain - where everything needs to be abandoned in order to try to recover the lost essence of the 'raw', 'unconditioned' body in pain (if at all possible), the only strategy available is one of surrender. Therefore, there is no transcendence of pain but rather a surrendering to pain through repetition. This repetitive surrendering is, in a surrealist way, an immanent falling backwards into the past; an effort to experience the very first encounter with pain, before it acquired symbolic significations and was cognitively codified and interpreted through specific elements.

However, behind such repetition lurks the potential trap of always trying to return to an 'authentic' experience and avoiding dealing with the actual pain. Trying to repeat an action and avoiding bringing full awareness to the current experience of pain in the hope of a more intense, raw, archaic or deeper experience of pain is problematic. Repetition as recollection is used as an escape from the actual pain and a quest for another pain. Repetition as recollection is also impossible 'because it ignores the decisive element of time, which changes everything with its passing. One can't repeat experience because the present self is not identical to the past self' (Jacobs, 2007: 253). This is exactly why Kierkegaard refuses the solaces of repetition as recollection and offers a new concept of repetition; one that moves forward rather than backward. Moving forward needs to be understood in relation to the future, and Niels Eriksen, a Kierkegaardian scholar, explains that the future needs to be understood 'as that which is genuinely new and other' (Eriksen, 2000: 166). This repetition is not one of memory and devolution (going back to the past) but rather one that actively constructs the subject in the future and moves forwards towards its evolution. Therefore, there is a move away from the current self and one's current perception of pain towards 'a new and other' self and a 'new and other' perception of pain. According to this understanding of repetition, a technique for training pain

perception would need to employ repetition as a way to construct a new perception of pain, one that moves away from the practitioner's past significations of pain.

The problem of the Kierkegaardian model is that in order to find the 'new and other' perception of pain, we always need to inspect the old ones, meaning the memories we have of pain. Furthermore, if I were to follow the Kierkegaardian notion of repetition as a principle when creating my own technique, it would mean that I would not be dealing with the actual pain but rather an idealised, future pain perception I want to build. As a consequence, I would not work towards discovering the actual reserves that might lie dormant within my body and that could help me to deal with pain; I would be fabricating new ones, in which case I would be working against the principle of surrendering action-control (whose purpose is to discover the hidden potentialities of the body). This creates another stalemate, and so a different perception of repetition has to be located.

The practice: the myth of Sisyphus

If the first model, repetition as recollection, was dismissed because it diverts attention away from the actual moment, and the second model of Kierkegaardian repetition – a model that focuses on how the present moment builds the future - was dismissed for the same reason, a third model of repetition is necessary to stand as a principle in the *Whirling in Pain* technique. So far, the notions of repetition as recollection and Kierkegaardian repetition have been shown to ignore the actual sensation of pain, and demand that the practitioner not be *in* it, but rather shift their focus towards remembering a past experience or constructing an ideal experience of pain. I propose an alternative and refer to this third model as 'Sisyphean reiteration', based on the classical myth of Sisyphus who was punished by the gods for his deceitfulness. Sisyphus was condemned to roll a rock to the top of a mountain, only

for it to fall back down over and over again. He would have to roll it to the top repeatedly for eternity, and Sisyphus knew that there was no way out of his task, no beginning and no end, no progression and no purpose, no *arche* and no *telos*. If the Platonic recollection is a move backward in time and Kierkegaardian repetition is a move forward in time, the Sisyphean reiteration is fixated and attracted to the present moment. Thus there is a recursive cycle of failure and attempt *ad infinitum*. Where the previous two models of repetition contain movement along the space-time continuum in the direction of the past and future, any movement in this third model is about eliciting the depth and vastness of space contained within the ephemeral, momentary nature of now. In the first two models, the mind exists in a state of dissatisfaction, always hungry for what is not currently there, whereas in Sisyphean reiteration, the repeater accepts that there is no escape from now; that any quest for past or future is futile as they are both imaginary constructions, and so focuses on understanding what is actual and present. Eckhart Tolle, who teaches meditation, explains what it means to focus on the now rather than on the past or present:

To have your attention in the Now is not a denial of what is needed in your life. It is recognizing what is primary. Then you can deal with what is secondary with great ease. It is not saying, "I'm not dealing with things anymore because there is only the Now." No. Find what is primary first, and make the Now into your friend, not your enemy. Acknowledge it, honour it. When the Now is the foundation and primary focus of your life, then your life unfolds with ease (Tolle, 2003: 41).

The Sisyphean repeater acknowledges that living in the past or the future is dysfunctional because it generates a constant undercurrent of unease, tension and discontent, which does not allow for living in the moment. Consequently, a certain sense of forgetfulness is necessary; a forgetfulness of anything else than the given actuality. The Sisyphean repeater concedes to the futility of any other movement

forward or backward, surrenders to the singular moment as if it was atemporal, and discovers within the sameness of a single moment its own otherness.

Therefore, Sisyphean repetition in the *Whirling in Pain* technique can be thought of as the reiteration of a singular action that produces very little (if any) pain on its own, but accumulates pain through a multiplicity of iterations through time. With every (re)iteration, the focus is on forgetting previous encounters with pain, to ignore projections of how this pain might be perceived in the future, and to concentrate on the physicality of the actual moment. The goal is to approach pain anew with the curiosity of a first timer, and to avoid coming to any thoughts or conclusions about it. This is a project of immanence, meaning it is about coping with pain by being *in* pain, keeping one's focus on the actual pain, not distracting thought or shifting attention to a past memory of pain or an idealised future pain. Moreover, this sense of repetition, of everything new yet unchanged - since I have no means of bringing cognitive comparisons between past and present to understand what has changed - helps me to learn to live within the moment and duration of pain, and develop coping mechanisms that existed within me but which I was unaware of previously. Thus, the fourth principle of the *Whirling in Pain*, the operation of a 'Sisyphean reiteration,' demonstrates that the goal is not to transcend pain but to direct attention solely on experiencing and coping with pain with each iteration. This goal is achieved by force of and through the Sisyphean repetition.

A post hoc analysis of *Whirling in Pain*: a technique for inflammatory and chronic pain

By studying and practicing the traditional Mevlevi whirling practice closely, adjusting it slightly and synthesising it with my pre-existing practice, and through expanding its scope to fit the goals of my research project, I have so far explained

how I have created a modified whirling practice that I call *Whirling in Pain*. This practice is based on the four aforementioned principles and stripped of any extraneous elements of the traditional practice such as costume, music, prayers, or religious belief. I use this hybrid technique as a training method for familiarising myself with pain, and preparing myself to cope with pain in performance.

The *Whirling in Pain* practice enables me to enter into an Altered State of Consciousness through the facility of gradual pain and accumulating fatigue, each time offering myself a new bodily knowledge of how to cope with pain. Since the practice teaches me how to deal with pain by being *in* pain, the goal of the coping mechanism is not transcendence of pain; rather, it is learning anew how to deal with pain by being *in* pain. I have explained in the previous paragraphs how the four identified and adjusted principles of Inquisitive Endurance, Embodied Knowledge, Surrendering, and Sisyphean Reiteration achieve this. By expounding upon the four principles of the *Whirling in Pain* technique throughout this chapter, I have been giving glimpses into the different qualities of the learning process and altered states associated with the *Whirling in Pain* technique.

In the concluding segment of the chapter, I will bring together the different qualitative characteristics of the *Whirling in Pain* technique in order to understand which of the three types of pain it can best serve. To this end, I will use the parameters from the intersectional framework of analysis of hybrid Somatic Practices and Altered States of Consciousness that I developed in the previous chapter, which are: goal, function, operation, time of transformation, approach, control, suggestibility, emotional expression, motor output, imagery, memory, sense of identity, sense of the ineffable, sense of time, and interaction with the environment. I have explained in different sections throughout the chapter how the *Whirling in Pain*

technique qualitatively meets these parameters. I will now draw this information together in order to give a summary qualitative analysis of the *Whirling in Pain* technique. This information is contained within Table 4.

Accordingly, the *goal* of the *Whirling in Pain* technique is for the practitioner to learn to cope with pain by being *in* pain. In the Principle of Embodied Knowledge, I have defined this goal as immanence because it teaches practitioners to deal with pain by keeping focus and attention on the sensation of pain (rather than shifting consciousness away from it). I have also explained via the principle of inquisitive endurance that the goal of the technique is to suspend automatic modes of responding to pain in favour of finding ‘new and other’ ways (as Ericksen calls them) to deal with pain. These ‘new and other’ ways lie dormant within the body (according to the Principle of Embodied Knowledge) and therefore the goal of the technique is immanence. Furthermore, if we consider each individual instance of the *Whirling in Pain* technique in isolation (irrespective of its accumulative and systematic qualities that come about through repeating the practice over time), the goal can be said to be autotelic, meaning that it prepares the practitioner to deal with the actual pain of this practice. This pain is to be located not within a single iteration, but rather within the accumulation of many iterations; therefore this pain is mostly of the inflammatory kind. This means that the goal of the practice is autotelic and it helps to deal with inflammatory pain³². However, if we want to consider the practice diachronically (meaning looking at the many individual times a performer practices this technique), then the goal can also be considered heterotelic, in the sense that each iteration of the practice not only develops the capacity to cope with the actual pain, but that there is an accumulative effect that occurs through the practice’s repeated iteration and

³² For more information on the definition of the inflammatory type of pain see Chapter Two.

familiarisation with its principles. In this case, the technique also helps to build up a pain-management method suited to dealing with chronic pain.

The *function* of the *Whirling in Pain* technique is both de-automatizing and systematising. De-automatization is a characteristic of Altered States of Consciousness, and was defined in an earlier chapter as inhibiting automatic responses to pain stimuli. Systematisation is a characteristic of Somatic Practices and was defined earlier on as the method for gradually developing the skill of dealing with pain. Since *Whirling in Pain* is a Somatic Practice technique that induces Altered States of Consciousness, it is logical to say that the function of the technique will contain characteristics of both Altered States of Consciousness and Somatic Practices. Indeed, in terms of the de-automatizing function, the behavioural and action-control surrendering principle demands inhibiting automatic responses to pain and giving up preconceptions of pain. It is also systematising since according to the Sisyphean reiteration and surrendering principles, the technique gradually builds up the skill of coping with pain.

The practice *operates* through four main principles: (1) Sisyphean repetition of a whirling movement, (2) surrendering, (3) meticulous attendance to the perfection of the technique and embodied knowledge, and (4) inquisitive endurance. Through these principles, I am able to transform my perception of pain and to cope with pain. With regards to the *time of the transformation*, by learning how to cope with pain by being *in* pain, the transformation of pain perception happens simultaneously with the practice in a gradual, uniform way. However, there is an accumulative effect taking place simultaneously when practicing on a regular basis. The practitioner who systematically and regularly practices the *Whirling in Pain* technique develops the ability to cope with pain by being *in* pain over time, making the transformation

diachronic. This means that the practitioner evolves and develops the coping skills not just during each individual instance of each practice, but also through a transformational arc that stretches from the first practice and throughout each subsequent instance.

The *approach* of the technique is defined by the Principle of Embodied Knowledge, which means that the transformation of pain perception happens only through the first person, the lived body experience, and not through textual or intellectual engagement. I have explained the role of embodied, pre-reflexive understanding over passive intellectual interpretation through Polyani's theory of *Tacit Knowledge*, giving me a *sense of ineffability* and a bodily knowledge that is hard to articulate through language.

In order for transformation to occur, I need to relinquish control of my automatic responses and behaviour towards pain stimuli, whilst at the same time maintaining full focus on controlling the whirling technique. Focusing on the technique and how it is executed in the present moment helps me to avoid *hyper-suggestibility*. I manage to attenuate my emotional expression even further by releasing muscular tension, even on the expressive areas of the body such as the face, although a feeling of release, lightness and/or discovery may appear momentarily. Other *motoric outputs* apart from facial expression include the release of centrifugal momentum through the flow of the robe, fatigue and nausea. I have also experienced an unwanted shaking of my arms several times, which I believe comes as a result of fatigue and through muscles that are not yet trained enough to hold the arms aloft for such long periods of time.

In order to keep my concentration focused on the present moment and not let my mind drift away to some past memory or future anticipation, my strategy is to

follow the advice of one of the meditative, contemplative principles: when a thought appears, rather than forcing myself to forget this thought (thereby creating a new thought about how to get rid of my initial thought), I try to name the thought. In so doing, I manage to get rid of it. As a result, my *awareness of time* shifts towards discovering and eliciting the dense depth and vastness of the ephemeral, momentary nature of now. In relation to my *sense of space*, I try to isolate myself from my environment in order to better concentrate on my practice; therefore, I do not have an awareness of my surroundings. In terms of my *sense of my identity* in this particular time and space when I have surrendered to the Sisyphean repetition, I experience a certain dissolution of it, and a discovery of some of my hidden reserves on how to deal with pain. This surrendering has often been referred to in this chapter as ‘death of the self’.

Through this qualitative analysis, it becomes clear that *Whirling in Pain* is most suitable for dealing with inflammatory pain, meaning pain that comes about due to the endurance of prolonged and sustained repetitions of an action. The technique teaches the practitioner how to deal with fatigue and nausea that is accumulated through time. Therefore it is most pertinent to practices that do not involve acute, physiological pain (meaning direct tissue injury), but rather inflammatory pain that is built up over time. This is already obvious in some of its principles (inquisitive endurance, Sisyphean reiteration) but also in its time of change, which is synchronous and gradual. Furthermore, the technique equips the practitioner with some long-term tools through its diachronic time of change parameter and heterotelic goal, which means that *Whirling in Pain* can also serve cases of chronic pain. The practitioner learns how to release muscular tension and surrender, and to let go of preconceived perceptions of pain, which seem to be taking control of and sensitising the central

nervous system of the patient.

This chapter has traced the historical origins of the *Whirling in Pain* technique, and how I have adapted and transformed the traditional, religious practice into its secular form by developing specific principles that will guide the performance practitioner to deal with pain in performance. These principles are embodied knowledge, inquisitive endurance, surrendering, and Sisyphean reiteration. All of these principles influence the *Whirling in Pain* technique qualitatively. I have analysed them throughout the chapter and concluded in this last segment that the technique is mostly suitable for endurance-related and chronic types of pain, based on a qualitative assessment of this technique grounded on the intersectional framework of analysis of hybrid Somatic Practices and Altered States of Consciousness that I developed in the previous chapter. The main characteristic of the *Whirling in Pain* technique is its affinity to pain-immanence, meaning that the performer learns to deal with pain by being *in* pain, by keeping focus and consciousness fixed upon the pain. In the next chapter, I will be looking at a technique of pain-transcendence, meaning one that prepares the performance artist to deal with pain by distracting attention *away* from pain, and will explain the main principles and qualities of such a technique.

Table 3: Summary of the intersectional analysis of *Whirling in Pain*

Goal	Immanence: to find methods of how to cope with pain within pain itself Autotelic: dealing with inflammatory pain Heterotelic: dealing with chronic pain
Function	De-automatizing through inhibiting automatic responses, cultural inscriptions Systematising through gradual familiarisation
Operation	Sisyphean repetition Surrendering Meticulous attendance to body and technique Inquisitive endurance
Time of change	Synchronous (inflammatory pain) although 'practice makes perfect', meaning there is an element of diachronic (chronic pain) Continuous, gradual, accumulating
Approach	First person, embodied, lived experience
Control	Surrendering control over automatic responses, behaviour and ego, but maintaining control of technique
Suggestibility	Focusing on the now, preventing hyper-suggestibility
Emotional expression	Concentration on the now Release of muscular tension and effort for attenuation of emotional expression (possible feeling of release and lightness)
Motor output	Release of muscular tension Being propelled by the centrifugal momentum of the flow Fatigue Nausea Shaking arms Release of muscular tension
Imagery	Visualisation of the physiological and anatomical body work
Memory	Focusing on the now: if memories or thoughts come, name them and let them go
Sense of identity	Death of the self Dissolution of the boundaries between self and other
Sense of the ineffable	Embodied, tacit knowledge that is sought after Avoiding confinement of language
Sense of time	Discovering and eliciting the dense depth and vastness of the elusive, momentary nature of now
Interaction with the environment	Blocking it out of perception

V. Neurobreathing: A Technique of Pain-Transcendence

'Pain is the great teacher of mankind. Beneath its breath souls develop.'

Marie Von Ebner-Esenbach

The previous chapter analysed *Whirling in Pain*, a technique of pain-immanence that demands focusing attention on pain. In this chapter, I will turn from the internally-focused technique (one of pain-immanence) to the externally-focused (one of pain-transcendence). More specifically, this chapter presents the *Neurobreathing* technique that I have developed as a method of preparing the performance practitioner to deal with pain in performance, and discusses the three operating principles – soft fascination and distraction, rewarding reinforcement of distraction, and exhausting the resources processing pain – that ensure its efficacy in pain management. Each of these three operating principles promotes a training technique that allows the practitioner to deal with pain by directing attention and consciousness towards experiences other than the pain. In what follows, I propose *Neurobreathing* as a technique of pain-transcendence. The idea of, and necessity for, a technique of pain-transcendence emerges in response to the *Whirling in Pain* technique, which is classed as a technique of immanence because it trains the practitioner to deal with pain by maintaining focus on pain, as explained in the previous chapter. In order to balance the technique of immanence, which demands the practitioner focus on, surrender to, and learn from the pain as it is experienced repeatedly, in order to familiarise oneself with and accept it, I have developed a complementary option, a technique of transcendence where the practitioner diverts attention away from, yet still manages to deal with pain. Furthermore, in Chapter

Three, I identified some themes that exist in previous performance techniques that fuse Somatic Practices and Altered States of Consciousness. Three of those themes carried through in the *Neurobreathing* technique are: controlled breathing (found in Artaud), trance and dissociation (found in Grotowski), and hyper-alertness in order to direct attentional resources away from pain (found in Abramović).

In what follows, I examine how the *Neurobreathing* technique prepares the practitioner to deal with pain through a transcendental alternative, and how these themes have been transformed and interpreted in the development of my own technique. I shall offer descriptive accounts of the technique I have developed, as well as offering accounts of the three key elements behind the technique. I will explain how these elements have existed so far within their respective fields, and how their use is combined to constitute the *Neurobreathing* technique. The chapter is divided into five main sections: the first is a description of the *Neurobreathing* technique as a way of drawing out its three main principles; the next three sections are discussions of each of the three principles; and the last one aims to respond to the question of why this is a transcendental technique and what types of pain it addresses. Here I will refer back to the parameters I have developed in the intersectional framework of analysis, in order to clarify how this transcendental option manifests itself qualitatively. In doing so, I will elaborate further on the definition of pain-transcendence as it is presented in the *Neurobreathing* technique.

What is *Neurobreathing*?

In 2013, I was invited to present a new performance at Discharge Festival. The theme that year was ‘No Pain, No Gain’. My performance was called *Between an*

*Octopus and a Plastic Explosive Brain*³³ (Kountouriotis, 2013). During this performance, I experimented with the ways my perception of pain influenced my brainwave activity.

In the production, I wear a Mindwave Mobile headset that measures brainwave activity and displays it on a screen. The performance starts with rapid breathing as a way of relaxing and entering into an Altered State of Consciousness. In their influential study, the founders of Holotropic Breathwork³⁴, Stanislov and Christina Grof, suggest that ‘tying inhalation and exhalation into a continuous circle of breath’ (Grof and Grof, 2010: 32) catalyses experiences of Altered States of Consciousness. In the performance, right after I enter into this state, I pierce my forehead with a hook. The hook is then attached to a rope which has a mini helicopter called Puzzlebox Orbit³⁵ tied to the other end. I have adjusted and programmed the Puzzlebox Orbit to hover - and in so doing, pull the rope and the hook - whenever specific brainwave thresholds are reached. Every time I maintain specific frequencies of brainwave activity that express meditative and relaxed states (a proprietary algorithm used by Puzzlebox Orbit that measures a person’s mental state of relaxation), the helicopter starts flying, pulling the rope and the hook away from me, creating a painful stimulus. The task is for me to maintain my state of mental relaxation whilst the machine is in the air and pulling my forehead. Whenever I lose

³³ See Appendix, Video 1

³⁴ Between 2006 and 2010 I attended several Holotropic BreathworkTM workshops and began experimenting with the form after 2012. Holotropic BreathworkTM is a psychotherapeutic practice that uses fast, deep breathing as a way of inducing Altered States of Consciousness as an approach to self-exploration and self-healing. It was conceived and developed by psychologists Stanislov Grof and Christina Grof in the late 1950s. For more information see: Grof and Grof (2010); Taylor (1994).

³⁵ Puzzlebox Orbit is a device developed by Neurosky, the same company that produces the EEG Mindwave Device mentioned later. It is a mini helicopter with only two functions: turn on and turn off. When paired together with the EEG Mindwave Device, the user’s brainwaves can be used to turn the Puzzlebox Orbit on or off. The EEG Mindwave Device is attached to the user’s forehead, measures the brainwaves, processes and sends the data to the Puzzlebox Orbit. The Puzzlebox Orbit receives the data, processes it and turns on and starts hovering, or turns off and lands based on predetermined algorithmic functions. These predetermined algorithmic patterns can be hacked and adjusted based on users’ preferences.

this relaxed mental state, the helicopter continues pulling away for a few more seconds before falling to the ground. I then have to relax and start again.

What was surprising to me was that, despite the fact it was the first time I self-inflicted pain in a performance (there was no rehearsal time) and had little to no experience of how to do it, I failed fewer times than expected, and generally my ability to cope with pain was relatively good. The ease of dealing with the pain made me realise that I could use this setting as a preparative method for other performances that include self-inflicted pain. By repeating and comparing it with the *Whirling in Pain* technique, I gradually came to develop a refined method that helps me to deal with pain in performance, which I call *Neurobreathing*.

*Neurobreathing*³⁶ is a technique that prepares the practitioner to deal with pain in performance and is made out of three components: breathing, music and neurofeedback, each used in a particular way. Due to its qualities, method and structure, the technique is mostly suitable for dealing with physiological and chronic types of pain. In a *Neurobreathing* session, the practitioner is attached to an EEG device (Mindwave Mobile³⁷) that measures their brainwaves whilst they are breathing in a specific rhythmic pattern. The experience is accompanied by music, the purpose of which is to ease, relax and distract the practitioner's attention away from pain. The goal of the practice is for the practitioner to maintain specific brainwave activity quota via the facility of the music and the breathing pattern. By practicing in the studio for several weeks, some of the questions that I had to respond to were: what is

³⁶ Because the research in this PhD emerges out of my own practice and due to the University's ethical restrictions, this technique has never been tested on other subjects other than the author of this dissertation.

³⁷ Mindwave Mobile was developed in 2011 by Neurosky as a way of producing a low-cost EEG device that would fit a consumer market within a number of fields such as gaming, education, automotive, and health. In their research, Abe et al. (2015) assessed the accuracy of the device and found that it had high levels of accuracy at 83% (69).

the purpose of the music and what is the best music to use? Which brainwaves should I be focusing on? How fast/slow is the machine in identifying my brainwave activity? How is my breath modulating my brainwave activity? And what is the best breathing pattern for pain management? To answer these questions, I examined each one of the three components of *Neurobreathing* (music, neurofeedback and breathing) in detail, in order to understand how they delineate the parameters of the technique, where they originate from, how they function in relation to pain management, and how they contribute to the effective operation of this technique.

Principle One: Soft Fascination and Distraction

Chapter Three documented the theme of trance and dissociation in Grotowski's work. It was explained that according to Grotowski, the performer needs to enter into a state of consciousness where attention is focused on the action and away from the pain, whilst still maintaining a high alertness and awareness in case of emergency. This was called 'healthy trance'. In this section, I expound upon the principle on which I approach the theme of 'healthy trance' and dissociation, and how I interpret it in the *Neurobreathing* technique. More specifically, the first principle of the *Neurobreathing* technique is: soft fascination and distraction. This first principle points out the role of music in the technique and explains the most efficient ways to use the music as a pain management method.

The roots: attentional resources, distractors and music for pain management

Introducing music to the *Neurobreathing* technique was initially inspired by the structure of Holotropic Breathwork practice, where music is employed as a catalyst for the breathers to tap more easily into an Altered State of Consciousness. Quite early on in the development of the *Neurobreathing* technique, I realised that the

role of music had greater potential beyond simply easing entrance into Altered States of Consciousness; it also had an analgesic effect on the perception of pain. With regards to pain management, studies show that music can be used in healing practices (Magill Bailey, 1986) (Bernatzkya et al., 2011) (Magill-Levreault, 1993), and music therapist Debbie Carol traces the history of music and pain management, explaining that music has actually been used throughout mankind's history as a way to heal and fortify the soul (Carroll, 2011). For example, ancient Greeks and Romans employed musicians to play music to facilitate healing in spas. Contemporary medicine is now starting to take advantage of the analgesic effects of music. Several studies have been conducted within the last two decades to assess the relationship between music and pain management³⁸. My goal then has been to study scientific literature concerning the effect of music on pain perception so that I might use music more effectively in my own training.

The starting point for the study of audio-analgesia was relatively recent, in 1960 when a group of dentists and anaesthetists proved that sound (white noise or music) during dental procedures was sufficient for analgesia in 65% of cases in a 1000 patient sample, none of whom had recourse to other analgesic methods (Garnder, Licklider and Weisz, 1960). Since then, scientific studies have focussed more on understanding what types of music are most effective, and at what times. In 2001, Nilsson et al. investigated whether the use of music and guiding voice during an abdominal hysterectomy could reduce the pain post-operatively. Nilsson created three groups of patients where sound was used differently in each one. In the first group, there was 'relaxing and calming' music accompanied by sea waves; in the second group, there was a guiding voice superimposed over the music; in the third group,

³⁸ For a brief literature review of scientific research on pain management and the use of music see Mitchell (2004).

there were recorded sounds of an operating room. The results showed that intra-operative music reduced the post-operative pain from as early as the first day. The study found the first group's music intervention was the most effective for pain relief, and that the combination of therapeutic suggestions with music was not as effective as the music alone (Nilsson et al., 2001). In a later study, the same scientists tried to compare the effect of music against silence. Results showed greater pain reduction post-operatively in the music group. The study showed that listening to music intra-operatively has the potential to lower post-operative pain, but benefits are time-limited to between just one to two hours after concluding listening to music (Nilsson, Rawal and Unosson, 2003). In all of these experiments, research has found that music can work as an analgesic by alleviating stress. This means that music can be used as another non-pharmacological method for the modulation of pain perception. My interest was thus finding the appropriate use of music for helping me enter into what Grotowski calls 'healthy trance'.

Biochemically speaking, research has shown that use of music pre, intra and post-operatively showed reductions in the production of cortisol, a dynamically active hormone that is released in response to stress (Miluk-Kolasa et al., 1994). In one of these studies, it was shown that music's capacity to reduce stress should be attributed to its distraction effect. Music makes the patients shift their attention from ruminating on the pain to relaxation and recovery (Khalifa et al., 2003). Music engages the central nervous system and absorbs attention. Since the brain has limited resources to process information, music occupies more attentional resources than usual and leaves fewer available to be utilised for pain processing. This process of exhausting attentional resources has the effect of reducing stress via the amount of cortisol production,

helping to keep the patient feeling more relaxed. This means that music itself does not automatically alleviate pain unless the listener actively engages with it.

In my own studio practice I found that music is effective as a cognitive coping strategy when it provides opportunities for focused attention and promotes absorption. This has led me to understand that distraction becomes an important element of pain perception. Distraction shows that we are basically recipients of more sensory inputs than we are able to consciously process; therefore, a filtering process occurs that allows the conscious processing of some information and suppression of the rest. The Nobel Laureate Daniel Kahneman explained this filtering process through the resource or capacity theory. Kahneman proposed a 'concept of a limited pool of information processing resources and that using capacity for one activity limits their availability for another activity' (Johnson, 2005: 90). This means that being in an activity that occupies attention diminishes the availability of attention and prevents other information from being consciously processed. The main criticism of capacity theory is that it does not allow for any two types of information to be processed simultaneously, nor does it explain how the level of demand for attention from one task can affect the execution of a secondary task. Scientists now believe in the multiple-resource theory, which suggests there are different resource pools of information-processing capacity (Basil, 2012). This means that the more similarities there are between two activities, the more likely they will compete for the same attention resources and meddle with each other's performance. The extent to which two competing activities utilise the same pool of resources will influence the extent to which they interfere with or suppress the processing of each other.

Consequently, distraction from pain needs to be understood as a competition between a highly salient stimulus (pain) and an attention focused consciously towards

a non-pain stimulus. As a result, the efficacy of the distraction is ‘affected by qualities of the distractor, the qualities of the pain experience being suppressed, and factors related to individual differences’ (Johnson, 2005: 90). Distractors should be engrossing and sufficiently challenging but not too difficult. For example, a very difficult task, like working on a deadline, might become stressful and lead to either loss of concentration in the task and the return of attention to pain, or a hyper-stimulated nervous system, which leads to sensitisation and is counterproductive to the operant learning at hand. Pain management clinical psychology emphasises that ‘a distractor that is able to alter mood, anxiety and arousal, and effectively engage attention is likely to be most useful’ (Johnson, 2005: 91-2). Distractors should help in ameliorating mood, reducing stress and anxiety, and they should be taken up voluntarily. Stephen Kaplan, a psychology professor, explains that attending to the distractors should be ‘effortless, and they [should] leave ample opportunity for thinking about other things’ (Kaplan, 1995: 174). Distractors then need to qualify as ‘soft fascinations’, meaning that they should absorb the attention of the practitioner in a tranquil fashion that does not fatigue or tense the person, yet at the same time exercise the mind to think of the distractor and its associations.

The practice: looping and flat dramaturgical arch

In the case of the *Neurobreathing* technique, understanding music as a ‘soft fascination’ distractor means that music operates as an attention-diversion technique. It does not make pain disappear but rather replaces pain with another focus of attention, thus making pain more bearable and increasing pain tolerance. Although attention is directed towards the music, the practitioner can still be aware of the surroundings and in case an obstacle appears, can easily avoid it. This means that the ‘soft fascination’ principle can serve Grotowski’s distinction between ‘healthy and

unhealthy trance'³⁹. Music shifts the attention away from ruminating on pain towards relaxation and recovery, but still allows for awareness and high alertness in case of an emergency. Music engages the central nervous system and absorbs attention by utilising more attentional resources than usual. Since the capacity and resources of the brain to pay attention are limited, there are fewer resources available to be utilised for pain processing, reducing stress and the amount of cortisol production, and helping in keeping the patient more relaxed. This means that music itself does not automatically alleviate pain unless the listener actively engages with the music. For that reason, the choice of music used as a cognitive coping strategy is effective only when it provides opportunities for focused attention and promotes 'soft fascination' absorption.

In the development of the *Neurobreathing* technique, I experimented with research that suggested using various different music genres. Some scientific research recommends using binaural beats - two different pure tone sine waves with tone differences of less than 40Hz from each other, playing on each ear independently – as reducing the fentanyl (analgesic substance) requirement of patients in general anaesthesia (Plourde and Villemure, 1996). However, in terms of my own practice, binaural therapy has not been very helpful because it did not prove sufficiently absorbing; I lost my attention, and after listening to a pre-recorded sound file with two sine waves having a difference of less than 40Hz (OspreyMusicInc, 2011), I actually began to find the sound quite distressing and annoying.

I also experimented with the music playlist of Holotropic Breathwork. Grof and Grof, the founders of Holotropic Breathwork, explain the structure and type of music they chose for their sessions:

The session typically begins with activating music that is dynamic, flowing, and emotionally uplifting and reassuring.

³⁹ For more information on this distinction see Chapter Three

As the session continues, the music gradually increases in intensity and moves to powerful rhythmic pieces, preferably drawn from ritual and spiritual traditions of various native cultures. [...] About an hour and a half into the session of Holotropic Breathwork, when the experience typically culminates, we introduce what we call “breakthrough music.” The selections used at this time range from sacred music - masses, oratoria, requiems, and other strong orchestral pieces - to excerpts from dramatic movie soundtracks. In the second half of the session, the intensity of the music gradually decreases and we bring in loving and emotionally moving pieces ('heart music'). Finally, in the termination period of the session, the music has a soothing, flowing, timeless, and meditative quality (Grof and Grof, 2010: 36).

By observing the structure and development of the Holotropic Breathing session, I noted that it shares many similarities with Gustav Freytag’s famous dramatic pyramid, although no reference to any conscious choice of that is made in Grof and Grof’s writings. In 1863, the German novelist and playwright, Gustav Freytag proposed a 5-act dramatic structure known as Freytag’s pyramid, which can be applied to most ancient Greek and Shakespearean drama in order to explain the unfolding of the dramatic plot. The overall structure of the Holotropic Breathwork session’s score corresponds with Freytag’s dramatic pyramid: like a dramatic play with a very defined, choreographed trajectory akin to Freytag’s 5-act structure: exposition (Grof and Grof refer to it in the above quote as ‘activating’, ‘reassuring’, ‘flowing’ music), rising action (‘rhythmic pieces’ that increase in intensity), climax (Grof and Grof call this ‘breakthrough music’), falling action (called ‘loving and emotionally moving pieces’ decreasing in intensity), and dénouement (called ‘soothing, flowing, timeless and meditative’ music). This pre-recorded, predefined orchestration manipulates the participants’ experience and leads them through a very specific and unavoidable dramatic battle of sensations, emotions and memories. This music playlist might prove effective for the psychotherapeutic setting of Holotropic Breathwork, but in the case of *Neurobreathing*, the music proved to be too imposing,

far more than what Kaplan calls ‘soft fascination’ in an ‘undramatic fashion’, strongly influencing the experience of the present moment and that of the self-inflicted pain. For example, in my own studio experiments, very fast, loud and dramatic music caused stress, anxiety and muscular tension, ultimately aggravating my perception of pain rather than helping to alleviate it.

Throughout my research into using music as a distraction for pain, I observed that the most effective music was repetitive and monotonous, providing a steady beat that allowed me to structure the rhythm of my breathing. In this case, repetition for me functions as a way of ‘softening’ the musical stimulus through familiarisation with the tune. Furthermore, I learned that looping the same song is more effective than creating a music playlist of several songs that follow one another because it provides a flat dramaturgical arch, minimising any musically-induced emotional tension and avoiding a ‘hard’ enforcement of specific emotions or memories. By making the music stimulus a ‘soft fascination’, I am more able to direct my attention on the music, distracting myself from the pain stimulus and thus becoming more able to cope with pain by transcending pain.

The principle of distraction explains how music can divert attention away from, and assist with coping with pain, but it does not ensure that the individual will systematically develop their skill in directing attention away from painful stimuli, especially when more primitive, instinctive reactions to pain demand one’s attention. It is therefore very important to learn how to systematically choose to distract oneself away from pain in order to guarantee the efficiency of distraction techniques when necessary.

Principle Two: Rewarding Reinforcement of Distraction

In Chapter Three, I identified the theme of hyper-alertness in Abramović's technique, in the way she fuses Somatic Practices and Altered States of Consciousness. Abramović uses hyper-alertness as a way of draining attentional resources and leaving few free for the processing of pain perception. In this section, I will explain how I have interpreted this theme into the second principle of the *Neurobreathing* technique.

Rewarding reinforcement of distraction is the second principle of the *Neurobreathing* technique. Its purpose is to ensure that the practitioner can develop the cognitive skills required to distract themselves from pain at will. It is closely related to, and derives from the theme of neurofeedback or EEG (electroencephalography) biofeedback. EEG is a specific type of biofeedback that trains people to take more control over their own brainwave activity. Neurofeedback is a real-time training procedure where brainwave activity is recorded and processed through a Brain-Computer Interface (BCI) before being fed back to the trainee via some form of understandable visual, auditory or tactile stimulus⁴⁰. In the case of the *Neurobreathing* technique, the practitioner is wearing a Mindwave Mobile headset⁴¹ with a sensor arm placed on the front of the head, and another one on the left earlobe. The brainwave data is sent via Bluetooth to a laptop, then processed and displayed electronically through software such as Brainwave Visualizer by Unity Player. In order to explain how neurofeedback is used in the *Neurobreathing* technique to help the performance practitioner deal with pain in performance efficiently, it is important to understand how brainwaves function, how they are related to different states of

⁴⁰ For a thorough introduction to the history and current application of neurofeedback, see Budzyski et al (2009).

⁴¹ I chose this device because it is widely available on the market, is low-cost, produces highly accurate results and has a user-friendly interface that makes it accessible for people with no neuroscientific background.

consciousness, and particularly their relationship to pain.

The roots: understanding brainwaves and their relationship to pain perception

When starting to work with the Mindwave Mobile device, I had to learn what brainwaves are, how they behave when I am in pain (and when I am not in pain), and what the graphs on my screen are describing. In what follows, I will explain the basics of EEG and neurofeedback but with a particular focus on what is most important to my study: the modulation of pain perception via neurofeedback.

Neuroscientists Kao et al. explain that a ‘brainwave is defined as arrhythmic of electric potential between brain cells called neurons and proficiently captured by EEG sensor’ (Kao et al., 2015: 2026). More specifically, when the neurons (either independently or in a group) fire, pause, and then repeat, the process is referred to as an ‘oscillation’. Neural oscillations are the result of the repetitive or rhythmic activity of an individual neuron, or the interaction between multiple neurons. The frequency of the oscillation refers to the number of bursts fired per second. The oscillations are detectable using encephalography (EEG), a non-invasive recording technique where flat metal discs (electrodes) are attached to the scalp and detect voltage fluctuations. For example, a frequency of 1Hz is a measure of 1 oscillation per second, which means that within one second there will be one burst of firings followed by one period of silence. The graphic depiction of each of these frequencies creates specific wave patterns, which we call brainwaves. Different names are given to brainwaves according to the range of their oscillation frequency (Pastorino and Doyle-Portillo, 2012: 141). Table 5 shows the most common EEG-detectable brain oscillations, their respective frequency range, and a graphical representation of their wave.

Each brainwave is associated with different states of consciousness. In my research, I

found there are three brainwaves that are directly involved in the processing of pain. The brainwaves most relevant to the study of pain are the alpha (awake, relaxed, meditating), theta (deep relaxation) and gamma (formation of ideas, memory, learning) frequencies. The following section gives a brief outline of how *Neurobreathing* training needs to focus on each of these three brainwaves as a way of coping with pain.

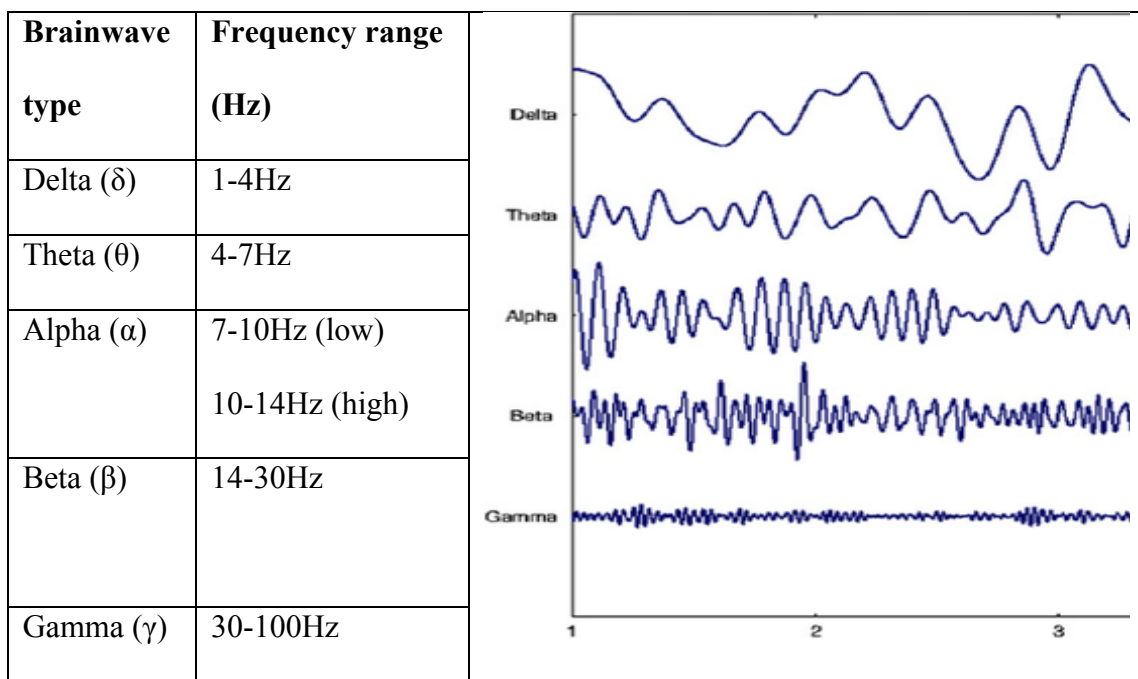
a. Alpha

Alpha activity is the most dominant rhythm in EEG and can be detected in 95% of healthy adults (Srinivisan, 1999). Alpha brainwaves are found when a person is awake but not processing much information. Alpha rhythm is subdivided into alpha-1 (lower alpha rhythms of 7-10Hz) and alpha-2 (upper alpha rhythms of 10-14Hz). The division of alpha rhythms into two bands is based on differences witnessed between the cognition of the two frequency ranges: alpha-1 activity is associated with active information processing, usually in situations of anticipation and attention, whereas alpha-2 is thought to be related to some sort of inhibitory process that dismisses information unrelated to the task at hand and refines important signals (Franciotti et al., 2009). It has been scientifically proven that this differentiation is particularly apparent when it comes to pain perception.

More specifically in relation to pain, several scientific studies have observed that during an acute pain stimulus, there is a significant lowering of the alpha band activity, called alpha blocking (Chang, Arendt-Nielsen and Chen, 2002) (Ploner et al., 2006). Alpha blocking means that an increase in the perception of an acute pain stimulus is directly linked to a decrease in alpha rhythm (Huber et al., 2006). Furthermore, chronic pain sufferers have lower alpha power and higher theta power than pain-free people of the same age (Jensen et al., 2013). Trifiletti et al. observed

Table 5: Brainwave types and their respective frequency range

(Urigüen and García-Zapirain, 2015)



that high alpha power represents intense analgesia (Trifiletti, 1984); many other scientists have since followed this train of investigation to prove the link between alpha power increase and acute pain relief (Chang, Arendt-Nielsen and Chen, 2002). Specifically, a number of scientific research projects have found that alpha-1 power (lower alpha rhythms in the range of 7-10Hz, which are related to attention or expectation of external stimuli) is inversely proportional to subjective pain (Chang et al., 2013). This means that alpha-1 brainwaves are correlated to the behavioural pain response and that increased alpha-1 means reduction of the subjective pain rating. So far, scientific studies have not yet established whether an increase of alpha-1 causes reductions in pain, or whether alpha-1 and reduction of subjective pain ratings are independent by-products of changes in attention and expectation (Ecsy, 2014: 27). In either case, whether the decrease of subjective pain rating is due to the change in expectation/attention or the increase in alpha-1 brainwaves, it is almost indisputable that subjective pain ratings can be modified by modulating both of these two parameters at the same time (attention and alpha-1). Very specifically, this means that the *Neurobreathing* technique needs to focus specifically on attention and reducing alpha-1 power.

b. Theta

Theta brainwaves are inversely proportional to alpha brainwaves. Buhl and Buszaki (2005) have suggested that theta waves may be responsible for encoding sensory stimuli (including pain stimuli). Research has shown that an increase in theta is related to higher subjective pain ratings. Patients with chronic neurogenic pain exhibit higher theta activation in comparison to pain-free subjects of the same age (Stern, Jeanmonod and Sarnthein, 2006). In relation to acute pain, scientists have also recorded an increase in theta power of approximately 150-350ms after the stimulus

(Ecsy, 2014). While theta power is not affected during an early peak (150-350ms), scientists have proven that distraction prior to the pain stimulus and an increase in alpha-1 activity decreases theta activity in the second peak (350-550ms) (Uusberg, Thiruchselvam and Gross, 2014). Therefore, following the evidence gathered in my previous paragraph on alpha brainwaves and how they can be used in the *Neurobreathing* technique, there is a strong indication that the focus within *Neurobreathing* should be placed on distracting attention *prior* to the pain stimulus being experienced as a way of decreasing theta activity, which will in turn lead to lowering the subjective pain rating.

c. Gamma

The most popular theory about gamma brainwaves is that they are an integral part of what we understand as subjective awareness. Similar to theta waves, there is an increase in gamma activity approximately 150-350ms after stimulation. Gross et al. (2007) have proven that the magnitude of gamma power is directly correlated with subjective pain intensity. It has been suggested that gamma activity in the neural processing of noxious stimulations is directly involved in the subjective perception of pain. Although no experiments have been conducted that prove an increase in gamma means higher subjective pain intensity ratings, there is a strong indication that this might be the case. In practice this means that the *Neurobreathing* technique needs to focus on decreasing gamma brainwave activity.

The practice: the five parameters that make reward reinforcement efficient

So far, I have shown that there is a growing body of scientific literature that supports the theory that high alpha (and in particular, alpha-1), low theta and gamma brainwaves are related to low levels of subjective pain ratings. It is not that the

increased production of these brainwaves lowers the subjective pain rating, in which case the individual would seek to simply change the numerical output shown on the screen; rather, it is that the individual chooses to enter into a state of consciousness that diverts attention away from pain, and as a result produces a consciousness whose brainwave levels display no stress and anxiety because of pain. As has been shown, this means that they are high in alpha-1 and low in theta and gamma brainwaves.

How then does the numerical data of the neurofeedback process help with pain modulation in the *Neurobreathing* technique if they are just expressions of our state of consciousness? Siegfried Othmer, a neurofeedback scientist, explains that:

Biofeedback is like a mirror to us, telling us how we look at a given instant in terms of how well our bodies are working. However, in this case the mirror has an opinion. It rewards us for moving the “bodystate” in the direction of better control, and withholds reward whenever our system moves in the wrong direction (Othmer, 2007: 2).

The brainwave data might then be understood as a system of rewarding or punishing grades - like receiving grades at school. The better the practitioner is at distracting attention away from pain, the better grades they are going to receive (high alpha-1, low theta and gamma). The brainwave data functions as a reward, promoting the reoccurrence of the same behaviours that distract attention away from pain. By looking at the numerical data, the *Neurobreathing* practitioner learns that it is more desirable to be in such a state of consciousness when pain occurs since it helps alleviate the subjective pain response. Through this system of reinforcing reward, which in neuroscience is called ‘operant associative conditioning’, the *Neurobreathing* practitioner manages to bypass the more primitive, instinctive reactions to pain that have become established through the non-associative

conditioning processes of habituation and sensitisation⁴². Consequently, they are more often able to choose states of consciousness that distract attention away from pain and help in lowering their subjective pain ratings.

In order to ensure efficacy of the rewarding reinforcement learning process in the *Neurobreathing* technique, I have used the same five parameters that neuroscientists, Sherlin et al. (2011) have designated as crucial for designing a neurofeedback study. These are: (a) speed of reinforcement, (b) type of reinforcement, (c) shaping, (d) artefacts, and (e) generalisation. Understanding how these parameters need to be adjusted when designing a neurofeedback pain management training programme can result in more efficient ways of reinforcing behaviours of distracting attention away from pain, and consequently help the practitioner learn how to prepare for dealing with pain in performance.

a. Speed of reinforcement

The time of delay between the response to pain and subsequent reward or punishment is crucial because it defines whether or not the event acts as a reinforcer. A long delay can mean that the subject fails to associate the conditioned response with either reward or punishment, thus decreasing the strength of the conditioning. Sherlin et al. explain that ‘there is no fixed rule on what is the minimum or maximum acceptable delay of a filter, and this also depends on the “required specificity,” but [...] the latency should not exceed 250 to 350ms’ (Sherlin et al., 2011: 298). Based on these findings, the device that I am currently using, a Neurosky Mindwave Mobile with a latency of 300ms means that information is received, coded, transferred to the laptop and displayed as meaningful graphs on my screen 300ms after the event has

⁴² For more information about associative and non-associative conditioning in neurofeedback, and in particular relation to pain, see Sherlin et al. (2011)

happened. The delay is minimal and the brain cannot perceive it; therefore, the way I manipulate my brainwaves seems to have a direct correspondence with what I see on the screen. A delay longer than this could cause difficulty in associating brainwave activity with the effect it has on the perception of the pain, and as a result might inhibit reinforcement of the behaviour.

In the performance *Between an Octopus and a Plastic, Explosive Brain* (Kountouriotis, 2013), I wanted the data to take on some form of movement in the performance space rather than just delivering the data visually on a computer screen. This was based purely on my desire to make the brainwave activity and my response to the pain more visible and tangible to the audience and myself. The mini helicopter that was attached to my skin via a hook would start flying, pulling the rope and creating a stronger pain stimulus. My goal was to maintain high alpha-1 and low theta and gamma brainwaves so that the helicopter would continue flying.

Although the Puzzlebox Orbit performance was supposed to give a clearer display of how I interpret and behave in relation to noxious stimuli, there was a significant delay between my mental state and the helicopter receiving commands based on the computer's processing of the brainwave data. This delay was counted to a length of approximately 900-1200ms. Moreover, the flight of the helicopter was unable to follow the acceleration pattern of my brainwave activity; rather, it only followed an ON/OFF pattern. This meant that the helicopter did not have a gradual acceleration or deceleration, but rather a simple binary of 'fly' and 'no fly' modes. While this delay could not be perceived by the audience (since they cannot know what is going on in my brain) it was particularly difficult for me to feel how my brainwave activity was influencing my meditative state and the consequent pulling of the helicopter. It is for these reasons that through my subsequent design of the

Neurobreathing technique, I have decided to leave out the helicopter in order to ensure that the delay remains within the window of 250-350ms.

b. Type of reinforcement

Previously, in the performance *Between an Octopus and a Plastic, Explosive Brain* (Kountouriotis, 2013), the way I received feedback on my brainwave activity was through the Puzzlebox Orbit. Unlike virtual graphs on a screen, I initially thought the physicality of the helicopter and its actual movement in the real space would be a very clear indication of my brainwave activity. I had read that Sherlin et al. (2011) explain that feedback needs to be delivered in a simple manner that can be rapidly perceived and interpreted by the subject. Complex interfaces become too difficult for the learner to extract meaningful information from, delay the post-reinforcement synchronisation, and as a result jeopardise the reinforcement process. The feedback setup works best when it is discreet, comprehensible, does not contain too much information, and makes the growth or decrease of a brainwave (which is the actual reward or punishment) clear to the individual. ‘Complex games are much more likely to “over-shadow” the response–reinforcer association by the formation of a more salient stimulus–reinforcer association’ (Pearce and Hall, 1978: 356). Therefore, in the application of neurofeedback, one ‘should stress exercise rather than entertainment’ and the reinforcement should lead to ‘knowledge of results’ (Stermann and Egner, 2006: 30). This research showed me that in *Between an Octopus and a Plastic, Explosive Brain* (Kountouriotis, 2013), the feedback was delivered in a complex way: Puzzlebox Orbit flies when I pass the thresholds of alpha-1, theta and gamma that I have pre-set. However, the delay in the transfer of information between my brainwaves and the helicopter's flight meant that the connection between brainwave activity and the Puzzlebox Orbit's flying complicated the relationship, and

so the use of sophisticated gadgets and technology overshadowed the purpose of the training. In that sense, I admit that the performance placed more emphasis on spectacle than the transfer of knowledge. Therefore, I now focus my attention on projecting graphs and data, and avoid the use of complicate scenography devices such as the mini helicopter.

For these reasons, I have decided that my preferred means of displaying information during *Neurobreathing* is a dynamic graph displayed through an application called *Brainwave Visualizer* that displays each brainwave independently with a different colour (see Image 2). Additionally, there are two meters that measure attention and meditation (based on a proprietary algorithmic function of the relation between the different brainwaves). I am using those two algorithms together with the graphs of alpha-1, theta and gamma brainwaves to check regularly how my state of consciousness is depicted numerically on the display. Every time I meet my thresholds, a discreet beeping sound is made, helping me not only to visualise but also listen to my brainwave output.

c. Shaping

Shaping is the process where the final stage of *Neurobreathing* training is achieved through successive approximations of smaller, simpler tasks that lead to the practitioner being able to deal with pain in performance. Shaping is important because it breaks down the process into smaller steps that are easier to accomplish, gradually building up the subject's skills by increasing the process' complexity. In relation to neurofeedback, 'shaping occurs by adjusting thresholds in an *a priori* direction to promote learning' (Sherlin et al., 2011: 299). There should not be a fixed threshold but rather a 'moving target'; auto-threshold should be avoided. Reward feedback can also be achieved even when moving in the 'wrong' direction. This means that the

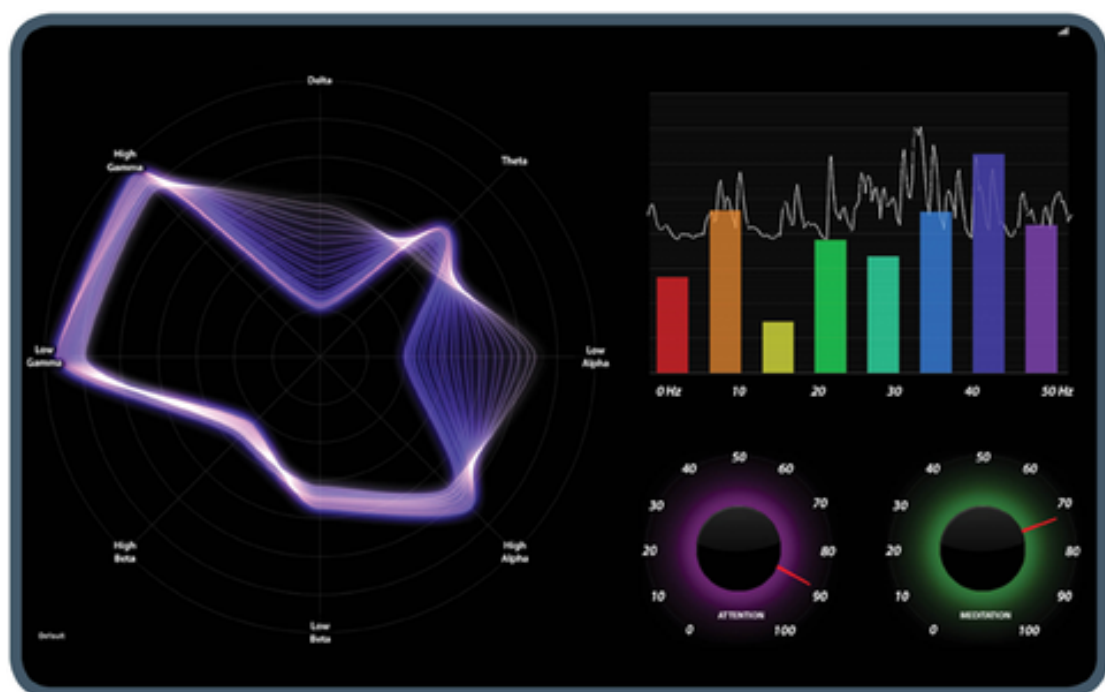


Image 2: *Brainwave Visualizer* Interface. On the left, there is a circular chart of different frequency bands. In the top right corner there is a chart with each frequency band shown independently. In the bottom right corner there are two e-Sense meters indicating attention and meditation.

threshold of alpha-1, theta and gamma power should not be pre-set to specific values; rather, it should take into consideration the physical and mental condition of the practitioner at the outset of the training session and push towards a gradual improvement throughout.

For example, I take the case of when I was tired from everyday chores and had my eyes closed during the training: I found my alpha-1 power was automatically significantly higher in that specific moment than during other training sessions. If auto-thresholding were in place, I would have been rewarded when no effort was actually being put towards learning how to calm down mentally. This would automatically lead to false rewards and ineffective training. As a result, I try to avoid auto-thresholding, continuously updating the threshold, taking into consideration the practitioner's physical and mental condition. In order to do this, the practitioner needs to write down a qualitative assessment of their own condition (how physically and mentally tired they are, how they might be affected emotionally etc.) at the outset of the training, and then take note of the brainwave data at a) the beginning of the session and b) of the overall training session (including the middle and end). This ensures a more personalised, customised training takes place, taking into consideration each individual's brainwave output at the beginning of each session and throughout the whole training session.

d. Artefacts

During the *Neurobreathing* session, different elements that can influence the recording of the brainwave activity and give erroneous results such as eye movement, breathing, distracting movements in the same room, or external sounds, are known as 'artefacts'. For example, a practitioner can reduce delta brainwave activity by learning how to blink less often. If this activity is not recorded as an artefact and is rewarded,

an incorrect learning process will take place. Sherlin et al. (2011: 300) explain that in any neurofeedback session it is imperative that the ‘equipment should be able to detect artefacts online, or better in real time. In addition, the [...] investigator has to closely observe the learner to avoid this “artefact-driven” feedback, thus also improving the specificity of what is trained’ (Sherlin et al., 2011: 300). In the *Neurobreathing* technique, this means that I try to avoid the live-streaming of artefact data because it complicates the display interface and gives me too much information to take into consideration. As a solution, I try to record my brainwave activity and eye-blinking as well as making a video of my session. After the session, I juxtapose the brainwave charts with the timeline of the video in order to discover how different events might have influenced my work. Building up my knowledge of how artefacts influence the recording of my brainwave activity is crucial. Rather than trying to avoid and conceal the possibility of these artefacts popping up during the session (an impossible task), I have found great benefit in recording them and understanding how they affect my mood. Such an approach towards artefacts is appropriate for situations where the practitioner has to deal with self-inflicted pain during a performance, and a plethora of artefacts might emerge.

e. Generalisation

Exercising brainwave activity over a neurofeedback screen interface is not the same as doing it without the equipment. Moving from regulating pain perception with the facility of equipment to real life pain management cannot happen automatically. The *Neurobreathing* practitioner eventually needs to learn how to exercise control over the trained parameters without the facility of the neurofeedback interface. Neurofeedback can prove valuable in relation to pain management, but in order to take advantage of the skill of controlling brainwaves in day-to-day life, a process

called generalisation should occur so that the learned skill can be exercised outside of the neurofeedback training session. Generalisation is the part of the training process when the practitioner can leave behind the use of the neurofeedback device because they are used to the training process, and can sense the neurophysiological changes that occur in their body on their own, without the need to rely on screen data anymore. The training sessions leading to generalisation are called 'transfer trials'. The most common transfer trial is one where the individual does not receive neurofeedback data in a live stream but rather at the end of the session. In their study, Winstein and Schmidt found that individuals showed better performance in this scenario compared to training where feedback was provided 100% of the time (Winstein and Schmidt, 1990). The process of generalisation should be gradual, and the possibility of returning to the neurofeedback equipment should remain, so that practitioners may refresh their learning memory and strengthen the reward reinforcement for states of consciousness that distract attention away from pain.

The goal of Principle Two: Rewarding Reinforcement of Distraction in the *Neurobreathing* technique is to offer the practitioner greater knowledge of how their state of consciousness (and more specifically, how their diversion of attention away from pain) affects the perception of pain. Generalisation functions as the final, emancipatory step where the practitioner can stop relying on neurofeedback data since they have gained sufficient knowledge about their own state of consciousness, and so is finally prepared and ready to deal with pain in the performance setting. After generalisation, the practitioner should have learned how to deal with pain in performance by being rewarded every time they distract attention away from pain. This knowledge should have been efficiently reinforced by attending to and

modulating the five parameters of neurofeedback mentioned above - type, speed of reinforcement, shaping, artefacts and generalisation.

Principle Three: Exhausting the Resources Processing Pain

Breathing, the third component of the *Neurobreathing* technique, originates from my desire to work on Artaud's theme of breathing and from my own personal study and practice of Holotropic Breathwork. In the psychotherapeutic setting of Holotropic Breathwork, breathing is used to facilitate entrance into an Altered State of Consciousness. The patient can tap into their memories and emotions in order to heal those causing distress. In the case of the *Neurobreathing* technique, breathing is not only used as a means of altering consciousness but, more importantly, of catalysing the occupation of neuromuscular resources that would otherwise deal with perceiving and reacting to pain. For this reason, I have strictly codified the rhythm, pattern and anatomy of breathing in the *Neurobreathing* technique, in order to ensure that the biochemical reactions in the body fulfil the purpose of the practice (exhausting the neuromuscular resources that deal with pain perception), unlike Holotropic Breathwork where the technique of breathing is not strictly defined⁴³. I have developed the breathing technique as follows: the practitioner starts by accelerating their breath to reach a fast *bhastrika* breathing⁴⁴ (one to two cycles per second) for approximately 15-25 minutes; after that, they reduce the hyperventilating *bhastrika* to a slower tempo, allowing moments of pause between the cycles. In order to come up

⁴³ During a Holotropic Breathwork session, breathers are instructed to breath faster and deeper, but no other specific instructions are given in relation to rhythm, pattern or anatomy of breathing. Due to this not-so specified technique of breathing, Grof and Grof explain that 'the physical response to Holotropic Breathwork varies considerably from one person to another' (Grof and Grof, 2010: 37). For them, this is to ensure that each breather will find their own way and ease, in order to activate the inner healing process.

⁴⁴ *Bhastrika* breathing is a Pranayama Yoga practice. It is a deep breath that is initiated from the abdominal muscles, and the duration and volume of inhalation is equal without a pause in between. For more information, read: Nugent(2007); Jerath et al. (2006).

with this specific pattern of breathing cycles, it has been necessary to study the biochemical reactions that are tied to this particular pattern of hyperventilating, and the reasons for slowing down after a specific amount of time.

Physiological studies: hypocapnia and hypoxia induce Altered States of Consciousness

In 1996, Pavel Terekhin, a clinical psychologist, conducted a series of experiments in order to measure the physiological responses of the human body during a Holotropic Breathwork session. Terekhin discovered that hyperventilation (produced through the faster and deeper breathing experienced during Holotropic Breathwork) led to hypocapnia, meaning a significant decrease in the amount of carbon dioxide (CO₂) in the blood (Terekhin, 1996: 731). As explained by Joe Miller, a yoga anatomy teacher, the following homeostatic mechanisms take place in the human body during hypocapnia. The reduction of CO₂ in the blood (called hypocapnia) creates a change in the alkalinity/acidity levels of the blood. Since CO₂ is acidic, a reduction in CO₂ increases in alkalinity of the blood (higher pH). When the pH in the blood rises and the blood becomes more alkaline, haemoglobin (the molecule that transports oxygen in red blood cells) holds onto oxygen more tightly, and so less oxygen travels to the brain as a result. The brain then reacts through a mechanism called vasoconstriction: a narrowing of the blood vessels, slowing blood flow down. ‘Thus, the brain gets hit with a double whammy during hyperventilation—less blood flow, plus less oxygen being released from the blood’ (Miller, 2013). The deprivation of an adequate oxygen supply to the brain is called hypoxia. Hypoxia is known for causing Altered States of Consciousness. Clinical neurophysiologists, Zwiener et al. measured brain activity during hypoxia and found an alteration in consciousness by reporting a slowing down of brain activation

rhythms across the brain, with substantial increases in the lower frequencies of delta and gamma (Zwiener et al., 1998). Several studies have reported different manifestations of Altered States of Consciousness such as ringing/roaring in the ears, clouded vision, and feelings of lightness, astonishment, and/or euphoria, as quickly as eight minutes after reaching hypoxemic levels induced through hyperventilation, followed by perceptual distortions and subjective 'visions' fifteen minutes after hypoxemic levels of hyperventilation (Agadzhanyan et al., 2003). From the above physiological analysis, it is clear that a reduction in the amount of CO₂ leads to hypoxia, which induces Altered States of Consciousness. However, this does not mean that it leads to greater pain management automatically.

The practice: From fast to slow *bhastrika* and post-tetanic exhaustion

In my own practice, I have found it extremely difficult to use the fast, deep breathing of the *bhastrika* directly with dealing with pain. There is too much vibration in the body due to the breathing pattern, which means that there is a lot of muscular tension, and as a result the body is not sufficiently relaxed. More importantly, in all my experiments with fast *bhastrika* I found that I was too over-sensitised when exposed to a pain stimulus, and I felt that the breathing produced the opposite results from what I was trying to achieve. This meant that psychologically speaking, I was not feeling calm enough and ready to transcend pain. After many experimentations with this technique, I felt it was important to study biologically why I felt over-sensitised, in the hope that this might lead me to a more effective way of breathing.

So far, I have explained that during the fast *bhastrika*, low levels of carbon dioxide means an increase in the alkalinity (pH) of the blood stream. 'This alkaline shift causes changes in a blood-borne protein called albumin. Albumin then binds to calcium, reducing the amount of free calcium in circulation. This in turn causes

peripheral nerves to become more excitable. These hair trigger nerves then fire repeatedly, sending signals to muscles that cause them to contract involuntarily' (Miller, 2013). This muscular reaction is called 'tetany', which is a neuromuscular irritability and an enhanced sensitivity due to falls in extracellular calcium ion concentrations. Having tensed muscles means compressed blood vessels limiting the supply of oxygen around the body. This event is called ischemia. Ischemia leads to increased production of substance P, which means increased pain sensitivity. Consequently, the *bhastrika* method of hyperventilation over a prolonged period of time produces an over-sensitisation of the nervous system. The enhanced sensitivity that I was feeling during my early experiments goes some way to explaining my physical inability to use the fast *bhastrika* to deal with pain directly, since my nervous system was over-sensitised. Furthermore, I noticed that during a *bhastrika* hyperventilation, my EEG reported higher levels of gamma brainwaves. Gamma brain waves mean higher subjective pain ratings. The higher levels of gamma brain waves also explain why I felt that my state of consciousness was not ready for dealing with pain. As a result, this over-sensitisation to pain due to the fast *bhastrika* seems, on first appraisal, to be contrary to the desired goal of this dissertation, mainly to induce analgesia in the performance context.

At this point, I could have easily stopped practicing the hyperventilating technique. However, Grof and Grof explain that within their own HB practice, 'the symptoms induced by hyperventilation initially increase in intensity, but continued breathing brings about their resolution and permanent disappearance' (Grof and Grof, 2010: 167). Tetany is only the mid-point of the experience. Persisting with the breathing (which produces tetany) can ultimately lead to release and relaxation within the muscles, and the abatement of tetany.

Therefore, I decided to persist in breathing whilst in tetany in my own practice. Doing so, I experienced a deep burning sensation within my muscles that released the tension, and gradually gave way to exhaustion after approximately five to ten minutes. Scientifically, this is called ‘post-tetanic exhaustion’, which leaves the muscles and nerves so weak that they are unable to react to any stimuli (Smith, 1976: 638). This neuromuscular inability to react to external stimuli is of particular interest to anaesthetic studies and my *Neurobreathing* project. Anaesthetists induce the mechanism of post-tetanic exhaustion by injecting different drugs and electronic devices into a specific area of the body in order to over-stimulate it, thus leading to neuromuscular weakness and exhaustion as a method of providing topical anaesthesia (Coté, Lerman and Todres, 2009: 126). This means that in *Neurobreathing*, persisting with the fast *bhastrika* breathing whilst in tetany will ultimately lead to biochemical neuromuscular exhaustion and topical anaesthesia. Practically speaking, if tetany appears within ten to fifteen minutes after the start of the fast *bhastrika* breathing, then the breather needs to persist for an additional five to ten minutes in order for the vasoconstriction and tetany to disappear, and the body to relax and release.

At this point, the body is, biochemically speaking, ready for dealing with pain, but psychologically speaking, the breather is still emitting the same gamma brainwaves which are prone to higher subjective pain ratings and over-sensitisation. The peripheral nervous system reports a biochemical, topical anaesthesia whereas the central nervous system is over-sensitised and still emitting high gamma brainwaves. In order to manage this disparity, and to reduce the intensity of movement and vibration during the *Neurobreathing* technique, I have decided that the practitioner needs to shift their breathing pattern at the point of post-tetanic exhaustion from fast *bhastrika* to slow *bhastrika* (five to six cycles per minute, which is relatively slow in

comparison to the normal breathing pace of twelve cycles per minute). The practitioner gradually relaxes their breath even further, allowing for a moment of passivity paused between inhalation and exhalation (no need to inhale or exhale air), and minimising the use of abdominal contraction and dilation. This slower, more relaxed breathing automatically leads to higher alpha and lower gamma brainwaves. This, as explained above, is the desired constellation of brainwaves for attempting to decrease subjective pain ratings, so as to deal with pain in performance.

In this way, exhaustion in *Neurobreathing* transforms from a negative quality into a significant principle for promoting topical anaesthesia, helping me to deal with pain in performance. In post-tetanic exhaustion, the body exhausts all possibilities to react to pain and, as a result, the body does not have the resources to feel pain. Relaxation through exhaustion is a way to anaesthetise the body in order to help it avoid the neuromuscular process of pain perception. Consequently, exhaustion helps the body to transcend pain by draining those resources that would otherwise be used to process the perception of pain.

A post hoc analysis of *Neurobreathing*: a technique for physiological and chronic pain

This section has so far expounded on the thinking behind the *Neurobreathing* technique's development, and has analysed how its three principles ensure efficient preparation for dealing with pain in performance. In what follows, I will describe a typical *Neurobreathing* session and qualitatively assess the technique's different elements.

A typical *Neurobreathing*⁴⁵ session takes place in a comfortable, isolated space so as to minimise any artefacts that could influence reinforcement as much as possible. In the room, there is a camera recording the session in order to facilitate generalisation of the technique's reinforcement, and the gradual development of the independent neuromodulating skill. The breather is wearing an EEG device (Mindwave Mobile) on their forehead and the data is displayed on a screen near enough so that the breather can read all the data, but also far away enough to allow some motility during the breathing session. In order to ensure an effective type of reinforcement, the display needs to show data in a way that is discreet and comprehensible, doesn't contain too much information, and makes the increase or decrease of a brainwave (which is the technique's actual reward or punishment) clear to the individual. The delay between the EEG detecting changes in brainwaves and the display of those changes on the screen should be as minimal as possible. The ideal speed of reinforcement is within the prescribed 250 to 350ms.

The session starts when the breather is comfortable, sitting in a lotus position with their eyes closed, spine erect and the weight of their upper body on top of the sitting bones. The breather starts accelerating their breath to a rate of approximately one to two breathing cycles per second. Breath needs to be deep. Each inhalation and exhalation should have the same duration and volume. There should be no pause between inhalation and exhalation. Both the exhalation and inhalation are forceful, passing through the nostrils and making a sound that is felt in the chest and throat, while the abdomen is drawn in and out sharply, consciously contracting and dilating. In pranayama yogic terms, this is the fast *bhastrika* breathing. It is preferable that the breather practices this technique of breathing many times beforehand in order to build

⁴⁵ An early version of this can be found at Appendix, Video 1 that shows the preparation for the performance *Between an Octopus and a Plastic Explosive Brain*

up the rhythmic and muscular coordination that is demanded for attenuating a constant and stable fast *bhastrika*. The breather should persist with the breathing even after tetany appears (approximately ten to fifteen minutes after the start). Effort should be put into keeping the rhythm and volume of the breath steady at all times. After approximately five to ten minutes the tetany should dissipate. At this point, the breather opens their eyes at their ease, and gradually slows their breathing down, allowing for passive moments of pausing in-between breaths. The breather should now concentrate on the screen and try to modulate the brainwave data that appears on the screen. Attention should be put towards the alpha-1, theta and gamma brainwaves. The breather should be taking their physical and mental condition into consideration at the outset of the training session, and push towards a gradual improvement throughout (augmenting alpha-1 and lowering theta and gamma brainwaves).

Throughout the whole session, music accompanies the training. Music should be carefully selected so as not to impose definite dramaturgies. The music should ameliorate mood, reduce stress and anxiety, and should function as a ‘soft fascination’. If the type of reward for the reinforcement is a sound (rather than just visual data on the screen), the sound needs to be clearly audible and differentiated from the background music.

Typically, once this process has concluded, and provided they have managed to meet the exercise goals, the practitioner should be ready to cope with self-inflicted pain for the purpose of performance. Although positive results can be visible from the very first session, it is important that the practitioner trains regularly in order to build up their skills such as mastering the fast *bhastrika* breathing and understanding how to modulate the brainwaves.

It is now important to assess how these terms that I have defined earlier (such

as artefact, generalisation, delay, *bhastrika*, alpha-1, distraction, reinforcement, etc.) affect the *Neurobreathing* technique qualitatively, as a way of extracting its unique characteristics and qualities. To this end, I will use the specific parameters of the intersectional framework of analysis for hybrid Somatic Practices and Altered States of Consciousness that I developed in a previous chapter, and which are: goal, function, operation, time of transformation, approach, control, suggestibility, emotional expression, motor output, imagery, memory, sense of identity, sense of the ineffable, sense of time, and interaction with the environment. This information is contained in Table 6. This analysis will help to identify the unique characteristics of my technique and show the differences with the other techniques mentioned earlier.

More specifically, the *goal* of the *Neurobreathing* training is to help me to cope with pain by transcending it, meaning shifting my attentional focus away from the pain experience and directing it towards the neurofeedback modulation and music. There is also scientific evidence that supports the theory that higher alpha-1 and lower theta and gamma brainwaves could have some analgesic effect, with experiments to prove such a claim still ongoing (Ecsy, 2014: 27) (Stern, Jeanmonod and Sarnthein, 2006). Furthermore, the session of the *Neurobreathing* technique should prepare the practitioner for transcending the self-inflicted pain of the performance adequately. If the technique is followed by an act of self-infliction, then the goal is autotelic, meaning that it prepares the practitioner to deal with the actual pain of this practice. This means that the technique is mostly pertinent to cases of physiological pain, meaning those types of pain that are the result of immediate and acute tissue injury (and not inflammatory pain⁴⁶). However, if the session does not lead to self-infliction of pain, then the goal can also be considered heterotelic in the sense that each session

⁴⁶ For a definition of the different types of pain see Chapter Two.

helps the practitioner accumulate skills throughout time (diachronically). This means that ultimately, the technique can also help in dealing with cases of chronic pain, since the practitioner learns how to deal with pain without the facility of equipment. This is achieved through the process of generalisation.

Furthermore, the *function* of the neurofeedback training technique can be perceived as de-automatizing (as explained in another chapter, de-automatization is a characteristic of Altered States of Consciousness and is defined as obstructing automatic responses to stimuli) in the sense of inhibiting habituation and sensitisation by changing the way the attentional resources are divided. The function is also systematising (as explained earlier, systematisation is a characteristic of all Somatic Practices and I define it as a gradual and methodical development of skills) if we consider that fast *bhastrika* needs to be practiced regularly and is a difficult technique to master. This also applies if we look at the theory of operant conditioning and generalisation processes as a way of moving the learning away from the computer-interface to real life situations.

The *Neurobreathing* technique *operates* through each three guiding principles: operant conditioning, distraction, and exhaustion; one could also argue it operates through modulating the power of alpha-1, theta and gamma brainwaves. The *time in which the change in perception* of pain happens is synchronic to the practice, and is situated around the post-tetanic exhaustion and the modulation of the brainwaves. This means that the technique helps to deal with those types of pain that occur through a single pain stimulus, meaning physiological pain (and not inflammatory types of pain that are not connected immediately with a pain stimulus). However, it is important to mention here that through the process of generalisation and transfer trials, there is an attempt to transfer the skill from the neurofeedback session to the

real world; in that sense one could argue that there is a certain attempt at diachronic enablement (which is also why the technique can help deal with chronic pain). Certain scientists have argued that ‘distraction's effect is not detectable in immediate ratings’ but rather, ‘after a delay, when the pain itself is gone and the person must base the judgment on a *memory* of the event, having been distracted may attenuate the recalled pain’ (Christenfeld, 1997: 327). The delay in modulation of the subjective pain rating because of distraction can vary from just a few milliseconds to periods as long as ten minutes.

However, the *sense of time* is different for the practitioner. During tetany within the breathing session, time seems intensified; after that it gradually gives way to a euphoric feeling of exhaustion and a sense of loss of time. During the neurofeedback modulation, the practitioner gains control over their sense of time by focusing on how they can alter their brainwave activity through time. In that sense, time becomes a coordinate of the modulation exercise. Furthermore, the focus of the training is for the practitioner to gain a more quantified *sense of self-identity*, and more specifically how their consciousness and way of thinking shifts through time. Whilst the practitioner gains a better sense of their brainwave activity, it is important that *interaction with the environment* is kept to a minimum: during the breathing session, the breather blocks out distracting visual stimuli by closing the eyes and focusing on their breath; they may also become ‘softly fascinated’ by the music. During the neurofeedback phase, the focus should be narrowed to the computer interface and block out any other information.

Although the breather learns how to transcend pain on their own, the training is facilitated by supporting the breather to perceive how their consciousness and brainwaves affect their subjective pain rating through technological means; in that

sense, I speak of a consciousness-enhancing prosthetic. The aim of such an *approach* is to gain control over one's consciousness and to voluntarily distract oneself through an engrossing task, shifting attention away from pain. Usually, breathers tend to feel highly *suggestible* to external stimuli, and in terms of *emotions and feelings*, the distractors (music and neurofeedback data included) should only influence the breather to the extent of helping to ameliorate mood and reduce stress and anxiety, and not dictate a dramaturgical arch.

In terms of *motor output*, it is important to note that approximately ten to fifteen minutes after the start of the fast *bhastrika*, the breather will experience an intense muscular irritability which is called tetany, and which causes some muscles to contract. The breather should persist as the tetany will eventually disappear leaving that area of the body muscularly-released because of exhaustion. From here on, the breather starts monitoring their brainwave activity and trying to modulate it. It is imperative that they learn to detect any artefacts that could interfere with the neurofeedback, and to distinguish between results based on actual brainwave work and those influenced by such artefacts. As a result, the *Neurobreathing* training aims to equip the individual with *control* over one's own breathing and consciousness, and does so by averting attention away from pain to a skilful utilisation of brainwaves.

During the neurofeedback part of the training, data *imagery* should be limited to simple graphs that show the brainwave modulation, and focus on learning rather than gaming. More specifically, the display should make what was once ineffable both tangible and comprehensible, mainly how our consciousness shifts by emitting certain brainwaves. This means that the *sense of the ineffable* during the breathing part of the session is substituted by concrete visuals that make the ineffable visible and tangible for better comprehension and control.

By qualitatively assessing the *Neurobreathing* technique and looking at its components, this train of discussion leads to the conclusion that it is mostly suitable for physiological pain, meaning pain that is a direct response to a noxious stimulus. *Neurobreathing* is not suited to cases of inflammatory pain since one of its key mechanisms is overloading the nervous system, in which case it could exacerbate the inflammation and worsen the pain. Through the technique's synchronic time of change, the practitioner exhausts his attentional resources by focusing on music rather than the acute noxious stimulus. As a result, the practitioner manages to soften the perception of pain. Furthermore, since the practice can only happen through the facility of a neurofeedback station, it mostly helps deal with pain that is currently persisting. However, if the generalisation process has been successful, the practitioner will have accumulated long-term skills in controlling their brainwave activity and attentional focus; this can help them to deal with chronic types of pain.

The focus of the technique is not to find meaning *in* pain as a way to deal with pain, but rather to avoid consciousness of pain altogether. This is achieved by either distracting attention away from pain and rewarding such behaviour, or by draining the resources that are responsible for the processing and perception of pain. It is for this reason that I call this technique one of pain-transcendence, because the practitioner learns to cope with pain by shifting attention away from and beyond pain. Unlike the *Whirling in Pain* technique, where the practitioner dives *into* the experience of pain, directing all consciousness to the phenomenon as it is lived and embodied, and which I call a technique of pain-immanence, the *Neurobreathing* technique guides the practitioner's consciousness beyond and away from the pain.

Table 6: Summary of the qualitative analysis of *Neurobreathing* training

Goal	Transcendence: to shift attentional focus away from pain to the neurofeedback modulation, and to be ‘softly fascinated’ by the music Autotelic: dealing with physiological pain Heterotelic: dealing with chronic pain (in the sense of familiarising oneself with pain and developing skills on how to deal with it)
Function	De-automatizing through inhibiting habituation and sensitisation Systematising through fast <i>bharstrika</i> leading to tetany and then slowing down, operant conditioning, generalisation and transfer trials
Operation	Operant conditioning Distraction & soft fascination Exhaustion [Possibly by producing higher alpha-1 and lower theta and gamma power]
Time of change	Synchronic to the practice, pertinent for physiological pain, situated around the post-tetanic exhaustion and modulation of the brainwaves. Partly diachronic, applicable to chronic pain, in order to develop the skill towards fast <i>bhastrika</i> ; generalisation and transfer trials also aim at a diachronic enabling Continuous, gradual, accumulating
Approach	Distracted. Prosthetic-enhanced consciousness facilitated by data on screen, embodied (body expanded through the computer interface)
Control	Effort to gain full control over the fast <i>bhastrika</i> and the emission of specific brainwave power
Suggestibility	Highly suggestible to music
Emotional expression	Distractors (music included) should help in ameliorating mood, reducing stress and anxiety
Motor output	Tetany (around 10 - 15 minutes after the fast <i>bhastrika</i>). Persisting for another 10 minutes leads to release and exhaustion. From here on, effort must be put into detecting artefacts, how they influence the neurofeedback, and to distinguish results based on actual brainwave work from results influenced by artefacts
Imagery	During the neurofeedback session: simple graphs that show the neurofeedback, focus on learning rather than gaming
Memory	There is a suggestion that distraction’s effect on pain is not immediate but rather attenuates recalled pain
Sense of identity	Better understanding through quantification of how consciousness shifts perception of pain

Instead of a Conclusion: A Manual for Practitioners

In the course of writing this dissertation on training pain perception and management in the performing arts, I have found it extremely challenging to bring the disparate disciplines that have contributed to my understanding of the phenomenon of pain perception together. On these occasions, studio practice and experimentation have been my only solace, the only method to make sense. The act of practical exploration and embodiment has always made clear to me how the different theories and ideas on pain perception could dialectically support each other and be synthesized into a meaningful entity. It is for this reason that I offer the Manual for Practitioners in lieu of a conclusion. Placing the manual at the end of my dissertation is a strategic decision: not only do I want to emphasise the practical nature of this research, and that fact that practice is both its goal and pivot point, I feel that the only way to understand the complex phenomenon of pain and pain management is through practice and embodiment (or, to put it differently, through Principle One of *Whirling in Pain: Embodied Knowledge*). The knowledge on the meaning, culture, biology, perception and sensation of pain that has been gathered throughout this research can only come together in embodied acts, and the Manual for Practitioners serves this purpose: it synthesises the knowledge and makes it operative in the form of a step-by-step guide for practicing two training techniques.

The purpose of writing this manual is to first and foremost address the gap in literature of the performing arts pedagogy on this subject, and to offer guidance to performance practitioners on how to deal with pain in a safe, effective and informed way. In other words, it is about gathering all the relevant knowledge and experience

related to the modulation of pain via the facility of these two techniques and presenting this information in an easily accessible and practical manner. The Manual for Practitioners has therefore been written with particular focus and care to help practitioners. Having closely observed the principles behind the development of the two techniques I have developed, *Whirling in Pain* and *Neurobreathing*, I will now pull together practical advice on how to use these two techniques and offer them to the reader in the form of a manual for practitioners. In offering step-by-step guidance to the two techniques, I am also enabling practical exploration and initiation of the seven Principles that I have distilled from my own practice-as-research. Here I refer to the distinction between principles and techniques used by Elizabeth Behnke, a phenomenologist and Somatics practitioner. Behnke explains that:

Principles are fundamental sources of discovery that enable the inspired person continually to invent creative strategies for working with others, whereas techniques are specific methods arising from such principles (Behnke, 1995: 317).

Based on this distinction, by filtering out generic principles of practice, not only can I offer practices that have worked successfully for me, I can also offer transferable guidelines that can be used in the future by other practitioners in order to better comprehend and embody my own techniques or develop their own. The practitioners interested in embodying the techniques or the principles are reminded that as with any physical based instruction it remains crucial to remember to work within the parameters of their own comfort and physical ability.

Four steps towards *Whirling in Pain*: a technique of pain-immanence

Whirling in Pain is a Somatic Practice where the practitioner whirls on the spot for a long period of time in a strictly choreographed way. By force of repetition,

the practitioner enters into an Altered State of Consciousness that helps to inhibit the automatic response of pain aversion, gradually familiarising themselves with pain to the point where they are able to cope with it. This technique is particularly useful for dealing with endurance-related pain, also called ‘inflammatory pain’ i.e. pain that is accumulated throughout performance over a period of time, because a particular action is insisted upon or repeated. This technique can also help to deal with neuropathic, chronic pain since it provides long-term transferable skills on how to deal with pain.

In order to learn how to deal with any kind of inflammatory or chronic pain, the practitioner must first learn how to deal with the specific pain produced through the actions of the *Whirling in Pain* technique. The practitioner will familiarise themselves gradually with how to be *in* pain and deal with it by following the four principles of the technique:

- Principle One: Embodied Knowledge (the body knows)
- Principle Two: Inquisitive Endurance (there is more to learn when in pain)
- Principle Three: Surrendering (abandoning preconceptions and automatic responses to pain)
- Principle Four: Sisyphean Reiteration (focus on the present moment).

The technique is built up through these four principles. After mastering all of them, the practitioner is ready to start the generalisation process: transferring the skills acquired by applying the four principles into other modes of performance.

Whirling in Pain is a technique that takes time to master. As a practitioner, you should learn each step successively, one at a time and in the order described before moving on to the final practice of generalisation. Your skills will be built up

through each step and will help you to familiarise yourself with the experience of pain. It is therefore very important that you do not rush to arrive at the final step. In the beginning, each step will demand a lot of work and concentration. As you continue to practice, you will be able to surrender to the experience. However, it is advisable that you do not attempt to progress to the next step as soon as you experience the sensation of surrender. Staying on the same step for longer periods of time will yield more knowledge. My advice is to be patient and build firmer foundations through repetition, otherwise the new step might seem too difficult. Eventually you will know when to move on to the next step.

In what follows, every step is accompanied by one of the technique's four principles. This is done to help the practitioner become accustomed to the principles gradually but it should be noted that all four principles actually apply to each and every one of the four steps. Therefore, it is advised that, after having mastered each step, the practitioner should revisit previous steps, experiencing them in the light of new knowledge gained about (and through) the newly introduced principle. For example, having mastered step one and the Principle of Embodied Knowledge, the practitioner will be introduced to the second step and the principle of inquisitive endurance; at this point, they could start practicing step two and occasionally come back to step one, informed by the knowledge of the second principle, and so on.

Step One: starting with the feet, and Principle One: Embodied Knowledge

The first step is to learn how to whirl on the spot without leaving it, whilst also keeping the whole left foot on the floor (from toes to heel). The goal is to be able to follow this repeated movement and find a flow that is uninterrupted by thinking about how to execute it correctly. Start slowly and build up your speed as you become more and more familiar with the movement.

In the beginning, you will want to concentrate on how to execute the pattern of movement exactly. At this early stage, it is important that you pay attention to detailed articulation of the foot, arms and gaze. Start by preparing the space where you will be working. Make sure that it is big enough to allow you to whirl without hitting any objects or bumping into obstacles, clearing these out of the way. For the beginning, I strongly suggest using a flat wooden board, on top of which you will learn to whirl (this will help to ensure that you whirl on the spot). It should have a smooth surface, be approximately one meter in both length and width, and no higher than half a centimetre (this is to ensure you are not going to fall over in the event you lose your step and come out of the square). Mark a big dot in the centre of the square and prepare the ‘nail’. In *Whirling in Pain*, the nail used in the traditional whirling practice is substituted with a smooth-surfaced doorknob, in order to keep the practice safe. The doorknob should be cylindrical in shape and have a diameter no bigger than two centimetres (it needs to fit comfortably in the space between your big toe and second toe - see image for an example). Screw-in and secure the ‘nail’ on the mark you’ve made on the wooden board. Put this wooden board in the middle of your practicing space. Before each practice, pour two to three cups of fine salt (the finest possible in order to ensure that it is not painful) over the ‘nail’; there should be enough to cover the nail and surrounding area. The salt will help you to check whether your left foot has stayed on the floor, and can also help disinfect any possible abrasions or wounds you might make during the practice. Make sure that at the end of every practice, you throw this salt away.

Before beginning each practice, it is important that you take some time for yourself to concentrate and calm down. I usually take a fifteen to twenty minute-long sitting, silent meditation. I focus on my breath, noticing the patterns and cycles it

follows without judging them in any particular way. During this time, if any thoughts, images or memories come into my mind, I acknowledge and name them, as a way of trying to take them out of my mind. This act of ‘emptying’ my mind by naming the thoughts (rather than thinking that I need to empty my mind, which is another thought in itself) enables me to bring my awareness to the here and now. It is important that I am already starting to practice how to centre my consciousness in the present moment.

After this, wash your feet and dry them well with a clean towel. In the traditional practice, washing the feet, known also as *abdest* or *wudu*, is done as a specific ablution ritual. In the *Whirling in Pain* practice, the reason for washing the feet is to avoid any dirt that might infect the foot in case there is a wound.

In the early stages of your practice, I would also recommend applying plasters with thick cushioning on the big toe, second toe and the skin in between these two toes of your left foot. The skin will rub against the ‘nail’ and this cushioning can provide some comfort until you become familiar with the experience of pain, and the skin becomes thicker and stronger.

After these preparations, it is time to start the practice. Step with your left foot on top of the wooden plank with the ‘nail’ in between your big and second toes. Try finding this spot without having to look at it. Then bring your right leg next to your left, and seal your left big toe with your right big toe (See image 5). When you are ready, take your right foot to the side (at the distance of your hips), turn your head to the left, and keep your arms in the sealed position (right arm over left and holding the shoulders). Throughout this step, the arms will stay in this position. Using the ball of the right foot, push the floor in order to pivot until the right knee is behind the left, and the heel of the right foot has come off the ground, coming up on the ball and toe of the right

foot. Next you want to lift your right foot up behind the left knee, then bring it closely around the left knee and direct it diagonally down as far away as possible (almost a 225 degree circle). Put the right foot down, pointing in the direction that you are turning. As you begin to turn, let the right heel come down and turn on both feet until the right foot is behind the left. By now you should have done a 360 degree turn. Then repeat the whole process. Throughout the whole movement, the left foot should never leave the floor (from toes to heel). In order to check whether this has been done correctly, observe the pattern of the salt: it should be a full circle without any interruptions or elliptic spirals.

Some important details to pay attention to at the beginning: (a) do a full 360 degree rotation before starting any of the movements again, (b) your left foot should stay on the floor (no tip toeing), (c) your head and eyes should be looking constantly over the left shoulder (do not look down, close your eyes or move your head looking forward instead of left), (e) your upper body should stay straight. When starting to work, you should practice for two to five minutes (depending on your abilities) before gradually building up to whirl for a period of fifteen to twenty minutes in length. At the beginning your whirls will be slow; there is no need to try to speed up, but try to find a regular rhythm gradually.

At this step, be aware of how your body gradually augments its intelligence. Notice how you are building your skills up and your body is learning how to move within the limitations of the technique. Let go of rational thought and open up to the



Image 4: Close-up photo of the ‘nail’ of the *Whirling in Pain* technique

learning process. The kind of knowledge you are acquiring on how to balance your body, how to find rhythm and also (and more importantly) how to deal with the pain in your foot can only be gained through practicing, not by reading a book or

rationalising the movement. It is like learning how to ride a bike: you can read as many books as you like about how to do it, but the actual learning of how to ride it can only happen once you are on that bike.

This is the first principle of *Whirling in Pain*: embodied knowledge. Trust the body and its ability to constantly learn and even relearn. For the time being, this is all the information you need. Just observe that you and your body are learning things that you could not learn any other way. In the next few steps you are going to learn how to take full-advantage of this skill. But for the time being, be patient.

Step Two: working with the arms and Principle Two: Inquisitive Endurance

After you have mastered the footwork, we begin working with the arms. So far, your arms have been in a sealed position. This is in order to bring strength to the upper body, and to help you learn how to rotate without losing your balance and sense of direction. Now we are at the stage where you can learn how to hold up the arms. The reason for having the arms up in an open position is because it is another method of building up your endurance; after some time, this position will become tiring. Firstly, it can help you to familiarise yourself with the pain of endurance; secondly, it will help you to discover your own mental coping mechanisms. Image 5 shows the correct method for opening your arms and how to hold them while whirling. During your whirling, lower both of your hands down to your waist slowly, with the hands facing back to back. Then raise your hands up again slowly, keeping your shoulders in the same position and staying centred. Slowly open the arms outward whilst the head is still looking to your left side.

At the beginning, you should practice by holding a wooden stick. Ask a friend or colleague to pass you this stick (which should be between 1 and 1.5 meters in

length) whilst you are whirling. Alternatively, if practicing by yourself, start by holding the stick close to your chest; once you have found your ideal rhythm, raise and hold it as high up in the air as possible whilst still keeping your shoulder blades down and your head looking to the left. You might feel the wooden stick is heavy, and that whirling without it would be easier; nevertheless, you should persist with the wooden stick and not rush to the next step. You will become familiar with feelings of tiredness whilst trying to hold the arms up. This stick will help you understand how to balance your two arms above your head and remind you that you cannot drop them. At this point, you should aim to learn how to whirl with your arms holding up the stick for approximately twenty minutes without a break. Important details to pay attention to at this point are: (a) try not to lower the stick or bend your arms, (b) make sure you maintain a straight posture in the upper body with your shoulders down and a strong, compact centre, and (c) check your gaze is soft, and the head and eyes are always looking over the left shoulder.

So far, you will have learnt that the body has its own particular way of learning. Now it is necessary to establish a certain curiosity within your body, not wait for the knowledge to come passively. While you are whirling, and enduring the muscular fatigue in your arms and legs, persist with an inquisitive spirit. Establish a non-judgemental outlook full of curiosity, one that simply observes, discovers and reflects on how your body shifts its perception and readjusts itself slightly in order to find its own rhythm in relation to the movement, the nail, the salt, the space. It is a slow process; the more your practice, the more you will learn that the steps are merely

FOOTWORK of WHIRLING IN PAIN



1. Toes sealed
2. Right foot to side
3. Pivot until right knee is behind left knee and come up on ball and toe of right foot
4. Lift right foot up behind left knee
5. Bring right foot up closely around the left knee
6. Put right toes down pointing in turn, let the right heel direction that your come down, turn on are turning both feet until right foot is behind left
7. As you begin to turn, let the right heel direction that your come down, turn on are turning both feet until right foot is behind left

HEAD and ARMWORK of WHIRLING IN PAIN



1. Right arm over left. Head facing left
2. Drop hands down to waist, hands back to back
3. Raise hands up centre of body
4. Open the arms, keeping head to the left
5. Right palm parallel with ceiling, fingers of left hand together, thumb and forefinger touching

Image 5: Foot, head and arm work of the *Whirling in Pain*

a gateway to experience different forms of embodiment, the ways in which you gradually transform your relation to a given situation, and to pain and endurance in particular. While you are getting used to the movement, you are also (re)familiarising yourself with the pain, gradually building up a new relationship with it. Stay open to the experience, and do not block your learning process by recalling previous painful sensations or emotions. Do not impose any other thoughts, processes, emotions or feelings on this process either. Simply observe how you are reconfiguring your relationship with pain, always curious about whatever new information might appear in your practices of embodiment. The body in pain will find its own way of coping.

Step Three: opening out the arms and Principle Three: Surrendering

After you get used to holding the stick in the air without too much mental or physical effort, it is time to try the same exercise without the facility of the stick. Repeat steps one and two but this time, rather than holding a stick up in the air, open up your arms to the side of your head. The arms should be as high as possible, with the palms of the hands never falling lower than eye level. Your right palm should be facing up, parallel to the ceiling while the fingers of the left hand should be together with the thumb and forefinger touching. Your shoulder blades should be down and sitting comfortably on top of the spine without creating any tension on the neck. It is important that throughout the whirling, you do not let your arms down at any moment; you should always try to keep them up even if they start shaking or feeling tired. Always check and maintain their exact placement and direction. With your eyes, try focusing on your left thumb. Your gaze should be soft, encompassing your peripheral vision. At this stage, you are relying less on objects and more on your own body, which makes it difficult to maintain balance since your arms are getting tired and want to fall down to either side. Whilst the practice is getting more and more

difficult, you need to learn how to let go and surrender. This process of surrendering should happen gradually rather than abruptly. It can be understood in several ways:

a. Physical surrender: biologists have proved that muscular tension (called ischemia) limits the supply of oxygen; as a result, it exacerbates the sensations of pain. Learn how to relax your muscles in your feet and arms. Try to avoid unnecessary tension.

b. Behavioural surrender: let go of preconceptions that create additional, unnecessary fear, and be open to new perceptions of the experience. Think of the example of the monkey trap. In South India, in order to capture monkeys, farmers will take a coconut, chain it to a tree and create a small hollow inside it, just big enough for the hand of the monkey to enter. They put a delicious treat inside, which will serve as bait for the monkey. The monkey smells the treat, puts his hand inside the coconut, clenches his hand to grab the treat and tries to take it out. Unfortunately, he cannot take the treat out since his clenched fist is bigger than the hole in the coconut. The monkey refuses to let go of the treat inside the coconut and as a result, loses his freedom. The trap is not a physical trap but a mental one, since the only reason the monkey is imprisoned is his stubbornness. In order to avoid falling for this ‘monkey trap’, observe your relationship with pain and let go of your preconceptions. By staying observant and curious, you will notice when you are reacting to pain automatically. Temporarily suspend this automatic reaction and instead, adopt an inquisitive approach to help you reconfigure your relationship to the pain.

c. Surrendering action-control: learn how to coordinate your body (which is in pain) to work *with* pain by suspending your primary self-defence mechanisms against the pain stimulus. Give up your body’s control over pain. Accept that it is futile to fight against it. This ‘letting go’ of your action-control needs to be perceived as a

volitional act of surrendering for the sake of efficiency. This will allow you to discover reserves and coping mechanisms that are lying dormant inside you.

d. Psychological surrender: recognise that your current perception of pain is not solely a physical, automatic, instinctive reaction, but one that has also been culturally-constructed. This reaction has very much to do with how we grew up, our environment, family, education and so on; in other words, all of those things that make up one's identity. Understand that your preconceptions of pain have been culturally engrained in the daily practices of your identity and that it is not simply a matter of changing behaviour in relation to pain temporarily, but rather a whole process of self-transformation. Surrendering in psychological terms means accepting that it is important to let go of your identity, your desires, your ego and your perceptions of pain.

e. Transformative surrender: this means to think of the process as a rite of passage where you allow yourself to be transformed within and because of the bodily experience, but without foreknowledge of the actual outcome. Give yourself the permission to enter into a place of unknowingness, and open up to the possibility of self-transformation.

Step Four: letting go of the 'nail' and Principle Four: Sisyphean Reiteration

Steps one to three have taught you how to whirl whilst grounded on the spot and keep your balance without feeling dizzy. It is now possible to stop relying on the wooden board and the 'nail', and to whirl through your own, individual capacity to stay fixed on the floor with good balance. Being able to whirl without the 'nail' and the salt will allow you to move faster and, after many repetitions, enter into an Altered State of Consciousness. In order to do that, first ensure that the space is enough to

allow you to whirl safely without hitting any objects or bumping into obstacles. The space should be at least 2.5 meters in length by 2.5 meters in width. The floor surface should also be as smooth as possible, and you should wear tight fitting leather shoes with a leather sole, since these will create better contact with floor. A leather sole is smooth enough to help you rotate, but also rough enough to push the floor and pivot without gliding. The shoe should be firm on the foot; a loose shoe means that the foot will rotate inside the shoe. Ballet, jazz dance or Irish dance shoes (without heels) should be perfectly fine.

Repeat the movement sequence for head, feet and arms as indicated in steps one to three. This time, try focusing on rhythm, flow and momentum. As you leave the 'nail' and have more freedom in the foot, discover the momentum of the centrifugal movement. You will feel this when you lift your right foot after the pivot, as the whole body will still be rotating a little. Take advantage of this movement: right before your body slows down, direct your right foot diagonally back onto the floor to help maintain the speed of the rotation. By now you should be able to adhere to the technical details of the movement without too much thought, which will give you the mental space to enter into an Altered State of Consciousness.

The way you treat this moment is very important. Often, when people repeat exercises, their mind starts drifting away to other thoughts and they mechanically reproduce the action. In the previous steps, the practitioner kept their attention on the experience because of, and through the facility of the objects involved. It is too difficult to avoid thinking about the 'nail' and the sensation of the foot rubbing on it, or the pain of holding the wooden stick. Now that the nail and stick are not there, the practitioner can easily fall into the trap of diverting attention away from the actual moment. According to the fourth principle, Sisyphean reiteration, the practitioner

should treat every single repetition of the whirl as if it were the first. This means that a certain sense of forgetfulness is necessary; a forgetfulness of anything other than the given moment. Focus should be directed towards experiencing the present. This also means forgetting how pain was experienced in the previous repetition, and also ignoring projections of how this pain might be perceived in the future. The principle of the Sisyphean mode of repetition is about learning how to approach pain anew with the curiosity of a first timer, and to avoid coming to any thoughts or conclusions about it. The goal is not to transcend pain, meaning to steer attention towards another thought or moment, but with each iteration to direct attention solely on experiencing and coping with the actual pain. In this way, the technique enables the practitioner to deal with pain by being *in* pain. That is why I call the *Whirling in Pain* a technique of pain-immanence.

Afterword

After you have mastered the four steps, you need to keep up with the practice regularly. Remember that ‘practice makes perfect’, and that there is always room to re-apply the four principles and gain more knowledge. Moreover, you have embodied the four principles and have understood their meaning. You are now in a position to find out how to make the *Whirling in Pain* practice relevant to your own work. You can leave the four steps and the whirling motion gradually, and concentrate on your own performance practice. The skills you have acquired through following the four principles are easily-transferable, relevant and appropriate to many different types of body-based endurance work. Start by applying the meaning and direction of each principle to your own endurance art practice. This process of generalisation, meaning opening up the principles to other practices, should be done gradually and diligently. There is no direct translation of a principle from one practice to another, and therefore

it is advisable to always return back to the *Whirling in Pain* practice in order to ground yourself and find what is essential to your own practice.

Three steps towards *Neurobreathing*: a technique of pain-transcendence

Neurobreathing is a technique that prepares you to deal with pain by averting your attention away from it, through the facility of music, neurofeedback and a specific breathing pattern. This technique helps you to deal with physiological pain, meaning pain that is directly related to direct tissue damage. The practice is not connected to a specific physiological pain, and since it already incorporates the step of generalisation within its methodology, you will be able to apply the skills to deal with any kind of physiological pain. Some of the skills you will acquire (especially learning how to modify and focus your brainwave activity, and how to shift focus away from pain) might also be relevant for those experiencing chronic, neuropathic pain, meaning pain that is not directly related to tissue damage, but is usually residual of a past injury and is erroneously overloading the nervous system. Learning how to deal with chronic pain is a durational process that comes after practicing the technique for a long period of time.

I propose learning the *Neurobreathing* technique in three steps. Each step will introduce one of the three operating principles:

- Soft fascination and distraction
- Rewarding reinforcement of distraction
- Exhausting the resources that process pain

You do not necessarily need to follow the steps in the exact order for the *Neurobreathing* technique but after you have mastered each step independently, it

will be important for them to be combined. Each step will offer a new dimension to the practice, and once you have managed to master each one of them and pull them together, you will discover that they complement each other. In fact, in many ways it might feel easier doing them together than separately.

Step One: music & Principle One: Soft Fascination and Distraction

You will start your practice by listening to music. For that purpose, I would recommend a surround-sound system. At this stage, you can use earphones/headphones as an alternative, but remember that from the next step, they will bring some artefacts such as electrical interference, distorting the brainwave data shown by the neurofeedback device. It would therefore be better to start and continue with the same setup so that you can get used to it. Make sure that the space is as sound-proof as possible, and that noises from outside cannot be heard while the music is playing. In terms of visuals, aim for an empty, discreet room. If there are windows try to close the curtains and block out any visual distractions.

After your initial preparations, you will need to choose your music. Some scientific research (Plourde and Villemure, 1996) has recommended using binaural beats: two different pure tone sine waves with tone differences of less than 40Hz from each other playing in each ear independently. However, from my experience, this sound can be quite distressing and annoying. The most important thing is that you choose a song that captivates your attention and makes you feel relaxed. The song should not propose or impose any emotional engagement; rather, it should have a steady beat (which will help you to structure your breathing rhythm later on) yet a ‘fascinating to listen to’ character. One song that runs for approximately thirty to forty-five minutes should be enough, but if you cannot find a song of your preference that runs to that length, you can always loop it. However, you should avoid creating a

playlist of different songs as this may create an unintended ‘dramaturgical journey’ that can prompt distracting emotions.

When you are ready, press the play button and come into a sitting position (preferably a lotus position). With your eyes fixed on a single spot (preferably directed somewhere forward and down at a forty-five-degree angle), try to let the music take your attention. Learn how to surrender your attention to the music voluntarily. Some elements that can help you to concentrate on the music include the rhythm, tune, structure, orchestration, mood, patterns, textures and/or mood. Attending to the music should be effortless; it should be a soft fascination, meaning that it should absorb your attention in a tranquil fashion without tiring or tensing you, yet at the same time exercise your mind. The reason why you should focus on the music and let it calm you down is because when you are fascinated by something, all your attentional resources are consumed by the stimulus. As a result, there are very few attentional resources to process other stimuli (including a pain stimulus). Music engages your central nervous system and occupies your attention. Since the brain has limited resources to process information, the music occupies more attentional resources than usual and leaves fewer to be utilised for pain processing. This process of exhausting attentional resources can help reduce stress and make you feel more relaxed. It is not that the music itself will alleviate the pain, but the fact that you are engrossed and fascinated by it.

Step Two: neurofeedback & Principle Two: Rewarding Reinforcement of Distraction

After you have learnt how to relax and become engrossed in the music, you will work on modulating your state of consciousness. For this step, you will need the following:

- An EEG device: I would recommend the Mindwave Mobile by Neurosky as it is a low cost and relatively efficient device
- A laptop or a mobile device that has the appropriate software installed, showing your live brainwave activity: there are many types of software available; some are free while others cost up to \$1500. If you are using the Mindwave Mobile, recommended apps include the Brainwave Visualizer 2.0 (freeware), MindOMeter (freeware for mobile phones and tablets) or the more elaborate Mindwork Station (which currently costs around \$180)
- Optionally, a video camera situated at a comfortable distance from your body, facing you and capturing both your body and face

Start by attaching the EEG device to your forehead and right ear firmly, and connect it to your laptop⁴⁷. Turn on your visualising application (Brainwave Visualizer 2.0, MindOMeter, Mindwork Application, or similar) and familiarise yourself with the interface. Each application has a different interface. You should be able to clearly see your alpha (especially alpha-1), theta and gamma brainwaves, and how your changing mood and brain activity causes these brainwaves to fluctuate. At this stage, you want to identify different ways to shift your consciousness. In order to achieve this, you need to enter into a state of deep meditation and high attention. In the three aforementioned visualising applications, there are two meters/dials that do not measure independent brainwaves but instead look at what they call ‘attention’ and ‘meditation’. These are highly recommended because they are actually processing and displaying a very complex relationship between different brainwaves in a simple fashion whilst you are trying to meditate. Without these monitors, it would be too difficult to process the information on your own in a live meditation setting.

⁴⁷ On how to connect the two devices please consult the manual of instructions of the device.

Start getting used to different ways of increasing your ‘attention’ and ‘meditation’ dials. To control your ‘attention’ dial, try concentrating your vision on one object; I would recommend that you try to focus your train of thought towards pushing the meter up. Another idea is to focus on the music (from the previous step) and try to observe the different elements such as orchestration, structure, texture, pattern, volume and mood. For the ‘meditation’ dial, what typically works best is to simply try relaxing. Connect to a sense of inner peace and calmness by clearing your mind of any thoughts. What works for me is to observe any thoughts that I have and name them, rather than try desperately to throw them out of my mind. This act of naming them helps me to reduce their emotional load. Ultimately I manage to detach them from my consciousness. The ‘meditation’ dial can also be increased by closing your eyes for a little while; this is because you have simply calmed down your visual input processes. It is therefore important that you learn to do the same by keeping your eyes open and calming your gaze.

Once you become familiar with the two dials, you will start to notice how the numbers on the screen change as your consciousness shifts. Now it is necessary to learn how to modulate your consciousness so that your subjective pain perception is lowered. You will know you are doing this correctly when your alpha-1 brainwave activity increases, and your theta and gamma brainwave activity decreases. In order to increase your alpha-1, try to adopt a ‘slow’ thinking process, almost like an idle brain. To lower your theta and gamma activity, try to focus, meditate, stay calm and find peace with your emotions (neither depressed or overtly excited). The brainwave graphs and data you see on the screen should be perceived as a system of rewarding or punishing grades, like receiving grades at school. The better you are in achieving the desired grades (high alpha-1, low theta and gamma) the more likely you are to

have lowered your subjective pain rating. To put it in another way, the more you can distract your attention away from pain and focus on getting these graphs to their desired state, the easier it will be to deal with pain. By observing the numerical data, you learn which states of consciousness are preferable for alleviating the subjective pain perception when in pain. Through the system of reinforcing reward, you manage to bypass the more automatic reactions to pain, learning how to choose and adopt states of consciousness that distract attention away from pain and help in lowering the subjective pain ratings.

Whatever device or visualisation interface you choose, ensure the efficiency of the process by paying attention to the following five parameters.

(a) Speed: the latency (meaning the time between the EEG device receiving the data, sending the data to your visualising app, which then processes and visualises it on screen) ought to be less than 350ms. Any delay bigger than that could make it difficult to associate the brainwave activity with your current state of consciousness, and as a result might inhibit the reinforcement of the behaviour.

(b) Type & Interface: the visualising app's interface should be easy to understand, not contain too much information, and make it clear how your brainwave activity is oscillating up or down. Do not try to work with a complex or fancy visualising application because it might be too distracting for the brain. Personally, I like working with apps that display each brainwave independently with a different colour on graphs that move through time. I also like using the 'attention' and 'meditation' dials.

(c) Shaping: when you get familiar with the interface, don't just focus on how your brainwaves are fluctuating up or down in the current moment; observe how your

general mood at that time of a day, or a different day altogether, might give you different numbers. The point is not to focus on absolute values of numbers, but rather on the shape of the graphs created on your visualising app.

(d) Artefacts: artefacts are small electronic signals that are non-neural in origin but are registered by the EEG equipment and mixed with the brain activity. Artefacts give erroneous results and seriously complicate the real-time identification of brain patterns. During the neurofeedback, it is extremely important to identify and eliminate these artefacts in an individualized way in the present moment. As a solution, I suggest video-recording yourself (body and face). After the session, juxtapose the brainwave charts with the timeline of the video in order to discover how different events might have influenced your brainwave activity work. Try to look for patterns of how artefacts influence the recording of your brainwave activity.

(e) Generalisation: this process should only be attempted once you have mastered all three steps and principles of the *Neurobreathing* technique. Generalisation describes the state when you can finally stop using all the gadgets and technology, and work solely with your body. You should stop using the neurofeedback technology gradually. In the beginning, try having the equipment in front of you but consult it less frequently. You are building up your skill to work independently steadily. Do not rush. You should always leave yourself the opportunity to come back to the technological setup, so that you can refresh your memory and strengthen the reward reinforcement process.

Step Three: breathing and Principle Three: Exhausting the Resources Processing Pain

You will now start learning how to modulate your breathing. Breathing is a powerful tool for altering your consciousness. Sit comfortably in a lotus position with

your eyes closed, spine erect, and the weight of the upper body situated on top of the sitting bones. Try to relax. Notice your breathing pattern and rhythm. When you feel ready, try to maintain equal volume and duration of your inhalations and exhalations, leaving no time in between⁴⁸. The exhalation should start by pushing the belly button in, pressing your diaphragm up and squeezing the air out of your lungs. Then suddenly, retract the belly button, drop the diaphragm and inhale as much air as possible. Both the exhalation and inhalation should be forceful, passing through the nostrils and producing a sound that is felt in the chest and throat. Each breath needs to be deep. Once you feel comfortable with the technique, start accelerating your breath until you are completing one to two breathing cycles per second. In pranayama yogic terms, this is the fast *bhastrika* breathing. If you are finding it difficult to maintain the technique and rhythm of the breathing, or if you are feeling that you are short of breath (in which case you are not inhaling and exhaling the same volume of air), slow down and start again. It is important to be very diligent and precise with your breathing at this point.

Approximately ten to fifteen minutes after you have mastered a constant and stable fast *bhastrika*, you will probably begin to experience an intense muscular contraction and tension, which is called tetany. You should try to ignore this sensation and persist with the breathing even though it might be slightly more difficult. After approximately five to ten minutes, you will feel a deep burning sensation; the tetany will fade away, and you will start to experience a kind of muscular exhaustion. This point is called ‘post-tetanic exhaustion’ and is very important for dealing with pain because it ultimately leads to biochemical neuromuscular exhaustion and topical

⁴⁸ Practitioners of yoga usually call this the moment of nothingness, when you do not inhale or exhale, but there is a small pause in between. For the purpose of this exercise, try to eliminate the moment of nothingness.

anaesthesia. Post-tetanic exhaustion will leave your muscles and nerves so weak that they are unable to process and respond to pain stimuli.

At this point, the body is, biochemically speaking, ready to deal with pain but psychologically speaking, you will not be able to because of the speed and tension of your breathing. You need to slow down your *bhastrika* breathing gradually. Minimise your use of the abdominal muscles and just let the diaphragm push the belly in and out comfortably, without any enforcement. You should aim to complete five to six breathing cycles per minute, which is relatively slow in comparison to your normal breathing pace of twelve cycles per minute. Start allowing small pauses in between inhalation and exhalation. This slower tempo and more relaxed breath will help you to enter easily into a high alpha-1, low theta activity state, the desired state of consciousness for a lower subjective pain rating.

Afterword for combining the three steps and principles

After you have learnt each step independently, it is time to put them all together. You will notice that the three steps work together synergistically and it will be much easier when you combine all three elements. I suggest the following order: start with listening to the music and becoming fascinated; feel its rhythm and gradually build up towards a fast *bhastrika*. After the tetany has dissipated, slow down and calm your breath again. Let the music fascinate you once again. Start looking at the screen to check your brainwave activity. Try to establish a high alpha-1 activity and a low theta and gamma activity, keeping your concentration on the music and neurofeedback process.

You can now start working with pain stimuli. Start with a very small pain stimulus of your choice; something that does not scare you or make you feel overly

uncomfortable. It could be a hot object, a slight prick with a needle, a contact with a knife, or anything else that can produce a physiological type of pain. Observe how this might be affecting your brainwave activity. If you notice that your brainwave activity is not consistent, or that you do not produce the desired brainwave activity, then remove the pain stimulus and go back to concentrating on the music and visualisation data. Most probably the pain stimulus was too strong and demanded more attention than your soft fascination with the music and neurofeedback training. You can either reduce the intensity of the pain stimulus or, if you feel confident, try to reintroduce the same stimulus. In any of the two cases, learn how to maintain your neurofeedback ‘grades’ and you will notice that the pain stimulus is no longer as acute as previously.

You can now gradually build up the intensity of the pain stimulus while you keep your attention on the neurofeedback data and music. In my practice, I have noticed that the post-tetanic exhaustion lasts approximately twenty to thirty minutes, which means that if you want to take advantage of its benefits, you need to work within this window of time. You will probably not be able to progress the intensity of the pain stimulus very far within the first few sessions. It is important that you do not give up, but continue practicing and training. Always, look at the neurofeedback ‘grades’ and try to observe which state of consciousness helps you feel the pain stimulus less acutely. You will steadily build up your embodied knowledge about how to shift your attention and consciousness.

After you have completed many sessions and feel ready to stop using the neurofeedback device, you can begin the generalisation process. Start by not checking the graphs on the screen quite so often. During later attempts, you can try to follow the whole process but only receive the neurofeedback ‘grades’ at the end of the

session, rather than in a live stream. Observe how well you did and try to interpret any major changes in your neurofeedback graphs by recalling any particular moments from your experience, or reviewing the video footage. Gradually you will be able to release yourself from the equipment and start working independently. However, do not be afraid to come back to the neurofeedback equipment to refresh your learning memory and strengthen the reward reinforcement for states of consciousness that distract attention away from pain.

Appendix: Videos⁴⁹

Video 1: Between an Octopus and a Plastic Explosive Brain (4min 44sec)

Concept and Creation: Pavlos Kountouriotis

Performed by: Pavlos Kountouriotis

Camera: Fenia Kotsopoulou

Editing: Pavlos Kountouriotis, Fenia Kotsopoulou

Vimeo link: <https://vimeo.com/85494206>

Video 2: Movement Monochromes (20min 17sec)

Concept- Creation: Pavlos Kountouriotis

Performed by: Pavlos Kountouriotis

Camera: Rodrigo Sobarzo

Editing: Pavlos Kountouriotis, Fenia Kotsopoulou

Music: Garbarek, J. (1996). *Evening Land*

Vainio, M., Fennesz, C. (1999). *32 Minutes 19 Seconds*

Vimeo link: <https://vimeo.com/143113149>

⁴⁹ The practical element of this practice based research PhD consists of: (a) The final section entitled, 'Instead of a Conclusion: A Manual for Practitioners' and, (b) the two videos listed here.

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